COLUMBIA LIBRARIES OFFSITE
HEALTH SCIENCES RESTRICTED
HR00554839

Serial v.20
D 1906
copy 1

Columbia University
in the City of New York
School of Dental and Oral Surgery

Reference Library

Digitized by the Internet Archive
in 2014

https://archive.org/details/dentalreviewdevo2019unse

THE
DENTAL REVIEW

DEVOTED TO THE ADVANCEMENT OF
DENTAL SCIENCE

C. N. JOHNSON, M.A., L.D.S., D.D.S.
EDITOR

VOL. XX.

CHICAGO:
PUBLISHED BY H. D. JUSTI & SON
55 STATE STREET
1906

13s

GENERAL INDEX.

A Certain Phase of Professional Ethics, 1040
A Death from Somnoform, 1055
A Personal Protest and Warning, 514
A System of Dental Surgery, 1288
Acid Treatment for Pyorrhea Alveolaris, 310
Acute Ulcerous Gingivitis, 459
Administration of Somnoform, 1169
Advice to the Young Practitioner, 958
Alveolar Abscess, 859
Always Make a Charge for Treatments, 1170
Amalgam Fillings, 957
Amalgam Inlays, 651
American Dental Society of Europe, 1241
American Illustrated Medical Dictionary, 1288
Another Vacation, 950, 1043, 1162, 1283
Anesthesia, 247, 431, 996
Anesthetics, Narcotics and Sedatives in Dental Practice—A Plea for the More Conservative Use of, 786
Application of Arsenic, 431
Application of Silver Nitrate, 856
Army and Navy Legislation, 513
Artificial Dentures, 856
Atrophied Teeth, 1, 105
Attaching Vulcanite to Metal Plates, 527
Attend Society Meetings, 957

Backing for Facings, 527
Baking Porcelain with Partition Wall, 772
Baking with Mica Door Furnaces, 1047
Bandless Porcelain Crown, The, 56
Banquet to Dr. L. P. Haskell, 633
Be Careful with Somnoform, 1169
Be Careful with Your Anesthetics, 959
Be Careful with Your Investigations, 956
Beginning and Burrowing Caries, A Comparison of, 437
Better Therapeutic Education of Dentists, 443
Black, G. V., Banquet to, 1299
Black, G. V. Dental Club, 596
Bracket Table, 1295
Burnishing Matrices for Inlays, 309
Burs, 647

Care of the Eyes and Eyesight by Members of the Dental Profession, 1235
Case in Practice, A, 528
Cement as An Aid in Starting Gold Fillings, 1050
Cement Fillings, 100
Cementing Inlays, 194
Chappell, Milton H., 200
Chicago-Odontographic Society, 154, 274, 391, 496, 614, 798, 938
Chittenden, Charles C., 199, 860
Cleaning Files, 1294
Cleanliness, 553
Cleanliness a Duty to Our Patrons, 59
Cleanliness in Dentistry, 474
Cleanliness in the Operating Room, 648
Clinics, 103, 202, 436, 596
Cocaine, 959
Collect Your Bills, 429
College Commencements, 757, 758, 859, 962
Colleges and State Boards, 631
Color for Porcelain Inlays, 197
Color Problem in Porcelain Inlays, The, 338
Colored Arsenic Mixture, 857
Compensation for Dental Services, 1168
Concentration, 289
Concerning the Porcelain Inlay, 1077
Constructing Porcelain for an Inlay, 530
Contraction of Rubber During Vulcanization, 99
Copper for Matrices, 650
Crouse, D. Howard, 201
Crowns, 1050

Danger in Administering Anesthetics, 1295
Death of Dr. C. R. Taylor, 1042
Definitions, 197
Deming, Charles Perry, 201
Dental Art, 857
Dental Education in the Public Schools, 1073
Dental Fees, 124
Dental History, The Value of, 949
Dental Prosthesis as Applied Science, 573
Dental Society, The, a Necessary Factor in Professional Growth, 137
Dental Society, The, Its Objects, Advantages and Organization, 677
Dental Societies, 312
Dentistry as a Business, 254
Dentists in Paris, 775
Devitalizing Pulps, 1170
Diagnosing Fracture of the Inferior Maxillary Bone, 310
Disadvantages of Porcelain Crowns with Bands, 197
Disinfectant for Instruments, 529
District Society, The, 1048
Dowel for Porcelain Bicuspid Crown, 99
Driving Up the Cows, 747
Duties and Obligations, The, of the Members of State Boards of Dental Examiners, 863

Early Correction of Permanent Teeth, 858
Echafolta, 1294
Echinacea Perfurea, Echinacea Augustifolia, Echafolta, 1095, 1218
Editorials, 79, 177, 289, 410, 513, 631, 746, 853, 949, 1040, 1061, 1282
Editor's Desk, 80, 179 290, 411, 516, 634, 747, 950, 1043, 1162, 1283
Electric Furnaces, 883
Electric Ovens, 1048
Enamel of the Teeth Decalcified, 317
Erosion, The Cause of, 513
Essentials in Electric Oven Construction, The, 878
Ethics, 344, 648
Etiology and Treatment of Pyorrhea Alveolaris, 905
Evils Incident to Use of Dam, 530
Evolution and Decay of the Tooth Brush, 988
Extending Cavities Before Filling, 313
Extension for Prevention, 135
Extensive Case of Restoration, An, 593
Extirpation of the Pulp and Filling the Root Canals, 470

Extracting Impacted Lower Third Molars, 1101
Extracting Teeth, 956

Failure of Fillings, 53, 196
Faulty Articulation, 99
Fees, 311
Fees for Advice, 752
Fiftieth Anniversary of the St. Louis Dental Society, 1282
Filling Children's Teeth, 648
Filling Large Cavities in Anterior Teeth, 752
Filling Material for Temporary Teeth, 855
Filling Materials for Cavities in Permanent Teeth of Children, 100
Filling Posterior Teeth, 752
Filling Root Canals, 649
Finishing Gold Fillings, 1046
First Permanent Molars, 428
Food Required, 430
For Sensitive Cavities, 1172
Form of Cavities for Inlays, 98
Fractures of the Inferior Maxillary Bone, Treatment of, 42
Fusing Porcelain, 431

Gold, A Few Experiments with, 979
Gold Fillings, 34, 312, 899
Gold Inlays, 38, 195

Handley, Robert E., 755
Harmony, 767, 1168
Harmony in the Dental Profession, 982
Heat as a Factor and an Aid in Treatment, 314
Helpful Hints, 145
Herbst Burnisher, 759
Higher Education of Dentists, 856
How to Succeed, 476
Human Teeth, On the Composition of the Dentine and Enamel of, 1090
Hygiene, 429
Hygiene of the Mouth, 430

Illinois State Dental Society, 632, 720, 811, 906, 1101, 1128
Immediate Root Filling, 528
Impression for Porcelain Inlay, 101
Inlay Principle, The, as Adapted to Individual Porcelain Crowns, 62
Inlays Should Be Used In Posterior Teeth, A Few Reasons Why, 132
Inlays in Posterior Teeth, 313
Inlays for Large Cavities in Posterior Teeth, 648
Intermaxillary Anchorage of Orthodontia, The, 465
International Dental Journal, 315
Interstitial Gingivitis Due to Antointoxication. Etiology, 1199

Judge Wilkes on Dentists, 535

Kay, William, 1053
Keep a Permanent Record of Your Work, 1169
Keep all Cavities Dry for Filling, 956

Letter from Bernard Bramm, 1166
Letter from J. R. Callahan, 1054
Letter from J. W. Cormany, 1289
Letter from E. C. Kirk, 644
Letter from G. Alden Mills, 1174
Letter from Garrett Newkirk, 645
Letter from New York, 87, 187, 296, 418, 523, 639, 749, 952, 1290
Letter from T. W. Pritchett, 1053
Letter from B. L. Thorpe, 1054
Lewis, Henry M., 432
Ligature, An Effective, 650
Local Anesthetics, 958

Make Your Artificial Dentures Yourselves, 751
Making an Examination, 1170
Making the Cap and Pin (Base of the Porcelain Crown) Easily Removable, 651
Material for Filling Children's Teeth, 956
Matrix for Packing Porcelain, 654
Mechanical Principles Applied to Cavity Preparation for Inlays, 1294
Membership vs. Non-membership of the Local Society, 791
Memoranda, 102, 202, 314, 433, 531, 652, 755, 859, 960, 1054, 1172, 1298
Metal for Dies, 1293
Method of Baking Porcelain, 1296
Method of Inserting Crystal Gold, 1171
Method of Making Amalgam Dies, 753
Method of Making Solutions of Cocaine and Eucaine, 1171
Method of Removing an Unbaked Inlay from the Cavity, 528
Method of Setting a Logan Crown, 855
Methods and Means, 367
Microbe's Point of View, From a 352
Milk of Magnesia in Pyorrhea Cases, 196
Minnesota State Board of Dental Examiners, 446
Minnesota State Dental Association, 375, 479, 1267
Misrepresentation, A Bare-faced, 853
Mixing Amalgam, 958
Moldable Dental Porcelain, 1048
Molding Rings, 196
Mouth Breathing, 528
My Summer Vacation, 80, 179, 290, 411, 516, 634

Necessity for a Chair of Oral Surgery in the Medical Curriculum, The, 233
Necessity for Greater Intelligence in Performing Dental Operations, The, 547
North Dakota Dental Association, 744

Odontological Society, 69, 256, 379, 703, 1027, 1110, 1270
Offensive Breath and Its Treatment, 1297
Oil of Cajeput, 957
Opening Large Cavities, 195
Orthodontia, or Malposition of the Human Teeth, Its Prevention and Remedy, 86
Our New Cover, 79
Our Strongest Weakness, 963
Our Younger Patients, 679
Oxy-phosphate of Copper, 752

Patents, 104, 202, 316, 435, 654, 852, 960, 1039, 1160, 1299
Pathologic Infant Dentition, 1210
Peculiar Case, 198
Phenomena Observed in Fusing Porcelain, Some, 223
Porcelain Crown, 98
Porcelain Inlays, 148
Porcelain Prosthesis, A Year's Progress in, 1196
Possibilities of a Professional Career, The, 213
Practical Hints, 98, 194, 309, 428, 527, 647, 751, 855, 956, 1046, 1168, 1293
Preparation in Cavities of Proximal Surfaces of Incisors Involving the Loss of the Incisal Angle, 530

President's Address, 205, 242, 476, 588, 666, 1108, 1175
Pressure Anesthesia and Arsenic, 994
Preventing Dental Caries, 195
Prosecuting Illegal Practitioners, 1048
Protecting Porcelain Surfaces for Solder Work, 751
Protection for Facings, 527
Proximal Cavity Preparations, 98
Proximal Cavities, 195
Public Supervision of the Dental Diseases of Children, 177
Pyorrhea Alveolaris, 129
Pyorrhea is Hereditary, 428
Pyorrhea Treatment, A Feature of, 31
Pyrometer Furnaces, 891

Reflex Neuroses, 668
Relative Food Values, 229
Relief for San Francisco, 633
Relief for San Francisco Dentists and Dental Dealers, 538
Remedy for Use in Treating Deciduous Teeth, 1047
Reminiscences of Forty Odd Years of Practice, 780
Removing Pulp with Local Anesthetic and Eucaine by Pressure Anesthesia, 152
Removing Glaze from Carborundum Stones, 1169
Renoform as a Local Anesthetic, 1193
Replantation or Implantation, 311
Report of Committee on Dental Art and Invention, 685
Report of Committee on Dental Science and Literature, 682
Resistance in Electric Furnaces, 1047
Role Played by Certain Acid Derivatives of Lactose in the Erosion of Teeth, The, 461
Roach's Moldable Porcelain, 868
Roach's New Opaque Porcelain, 348

Save Your Money, 1169
Scrap Pile for San Francisco Sufferers, 656
Sealing Arsenic in Buccal Cavities, 98
Selecting Shades, 529
Selecting Teeth for Dentures, 856
Send in Your Hints, 432
Setting Saddle Bridges with Cement, 99
Sixty-two Years of Dentistry, 1062
Skiagraphs as An Aid in Crowning Roots, 529
Sloughing Following Cocaine Injections, 957
Solution to Remove Stains of Silver Nitrate and Other Salts of Silver, 1293
Some Needs of Dental Societies and Their Members, 1230
Some Possibilities of the District Society, 902
Some Principles in Furnaces, 894
Somnoform, Its Use and a Few Personal Experiences with It, 972
Southern Wisconsin Dental Society, 1249
Sterile Water, 1294
Sterilization of Instruments, 312
Sterilization and Disinfection as Related to Water, Instruments and Soft Tissues, Including Putrescent Pulps, 1057
Strange Phase Against Extension for Prevention, A, 566
Successful Business Methods, 430
Suggestion, 194
Suitable Neckwear for Dentists, 1161
Superiority of Gold Inlays, 1296
Supreme Court Decision on the New Dental Law, 654

Taking a Bite, 527
Taylor, Charles R., 1053
Teach the Shopper to Appreciate Your Services, 1049
Testing an Electric Furnace, 1049
The Dental Review for 1907, 1282
The Pending Army and Navy Dental Bills, 1300
The Teeth and Their Care, 951
The World's Anatomists, 418
To Crown or Not to Crown, 410
To Etch the Surface of a Gold Inlay, 649
To Insure an Even Mixing of Colors, 648
To Keep Hypodermic Needles from Rusting, 751
To Keep Your Flasks Clean, 648
To Polish Plates, 751
To Polish Rubber Plates, 309
To Prepare Aluminum Plates for Rubber, 309
To Prepare the Floor of the Cap for a Porcelain Crown, 527
To Remove Coating from Instruments after Boiling, 310
To Set An Inlay, 309
To Soften Calculus, 751
To Spur Aluminum Base Plates, 98
Tooth Brushes, 1171
Transactions of the Fourth International Dental Congress, Vol. III, 418
Treating an Alveolar Abscess, 753
Treating Cavities with Nitrate of Silver, 528
Treating Putrescence in Roots, 1295
Treating Putrescent Pulps, 100
Treating Putrescent Pulps in Deciduous Teeth, 100
Treating Pyorrhea Cases, 311
Treatment of Burrowing Decay, 650
Treatment of Cavities Before Filling, 101
Treatment of Children in the Office, 858
Treatment of Erupting Teeth, 857
Treatment of Patients, 429
Treatment of Patients and Dentists, 238
Treatment of Sensitive Dentine, The, with Special Reference to the Production of Anesthesia by Pressure, 1185

Uniform Fee Bills, 950
Use the Rubber Dam, 752
Utilize Your Worn Mandrels, 428

Value of Local Dental Societies, The, 746
Vision, The Larger, 1068

Wedelstaedt, E. K., 755
What Does the Dental Profession Most Need? 558
What we Lack, 1104
Why and How I Fill Children's Teeth with Gold, 450
Why Porcelain Changes Color in Fusing, 429
Wisconsin Case, The, 536
Wisconsin State Dental Society, 65, 165
Worn Mandrels, 309

X-Ray, The Use of the, In Dentistry, 657

PRACTICAL HINTS.

A Case in Practice, 528
Acid Treatment for Pyorrhea Alveolaris, 310
Administration of Somnoform, 1168
Advice to Young Practitioners, 958
Always Make a Charge for Treatment, 1171
Alveolar Abscess, 859
Amalgam Fillings, 957
Amalgam Inlays, 651
An Effective Ligature, 650
Anesthesia, 431
Application of Arsenic, 431
Application of Silver Nitrate, 856
Artificial Dentures, 856
Attaching Vulcanite to Metal Plates, 527
Attend Society Meetings, 957

Backing for Facings, 527
Baking with Mica Door Furnaces, 1047
Be Careful with Somnoform, 1169
Be Careful with Your Anesthetics, 959
Be Careful with Your Investigations, 956
Bracket Table, 1295
Burnishing Matrices for Inlays, 309
Burs, 647

Cement as an Aid in Starting Gold Fillings, 1050
Cement Fillings, 100
Cementing Inlays, 194
Cleaning Files, 1294
Cleanliness in the Operating Room, 649
Cocaine, 959.
Collect Your Bills, 429
Color for Porcelain Inlays, 197
Colored Arsenic Mixture, 857
Compensation for Dental Services, 1168
Constructing Porcelain for an Inlay, 530
Contraction of Rubber During Vulcanization, 99
Copper for Matrices, 650
Crowns, 1050

Danger in Administering Anesthetics, 1295
Definitions, 197
Dental Art, 857
Dental Societies, 312
Devitalizing Pulps, 1170
Diagnosing Fracture of the Inferior Maxillary Bone, 310
Disadvantages of Porcelain Crowns with Bands, 197
Disinfectant for Instruments, 529
Dowell for Porcelain Bicuspid Crown, 99

Early Correction of Permanent Teeth, 858
Echafolta, 1294
Electric Ovens, 1048
Ethics, 648
Evils Incident to Use of Dam, 530
Extending Cavities Before Filling, 313
Extracting Teeth, 956

Failure of Filling, 196
Faulty Articulation, 99
Fees, 311
Fees for Advice, 752
Filling Children's Teeth, 648
Filling Large Cavities in Anterior Teeth, 753
Filling Material for Temporary Teeth, 855
Filling Materials for Cavities in Permanent Teeth of Children, 100
Filling Posterior Teeth, 752
Filling Root Canals, 649
Finishing Gold Fillings, 1046
First Permanent Molar, 428
Food Required, 430
For Sensitive Cavities, 1172
Form of Cavities for Inlays, 98
Fusing Porcelain, 431

Gold Filling, 312
Gold Inlays, 195

Harmony, 1168
Heat as a Factor and An Aid in Treatment, 314
Higher Education of Dentists, 856
Hygiene, 429
Hygiene of the Mouth, 430

Immediate Root Filling, 528
Impression for Porcelain Inlay, 101
Inlays for Large Cavities in Posterior Teeth, 648
Inlays in Posterior Teeth, 313

Keep a Permanent Record of Your Work, 1169
Keep all Cavities Dry for Filling, 956

Local Anesthetics, 958

Make Your Artificial Dentures Yourselves, 751
Making an Examination, 1170
Making the Cap and Pin (Base of the Porcelain Crown) Easily Removable, 651
Material for Filling Children's Teeth, 956
Matrix for Packing Porcelain, 654
Mechanical Principles Applied to Cavity Preparation for Inlays, 1294
Metal for Dies, 1293
Method of Baking Porcelain, 1296
Method of Inserting Crystal Gold, 1171
Method of Making Amalgam Dies, 753
Method of Making Solutions of Cocaine and Eucaine, 1171
Method of Removing an Unbaked Inlay from the Cavity, 528
Method of Setting a Logan Crown, 855
Milk of Magnesia in Pyorrhea Cases, 196
Mixing Amalgam, 958
Moldable Dental Porcelain, 1048
Molding Rings, 196
Mouth Breathing, 528

Offensive breath and Its Treatment, 1297
Oil of Cajeput, 957
Opening Large Cavities, 195
Oxy-Phosphate of Copper, 752

Peculiar Case, 198
Porcelain Crown, 98
Preventing Dental Caries, 195
Prosecuting Illegal Practitioners, 1048
Protecting Porcelain Surfaces for Solder Work, 751
Protection for Facings, 527

Proximal Cavities, 195
Proximal Cavity Preparations, 98
Pyorrhea is Hereditary, 428

Remedy for Use in Treating Deciduous Teeth, 1047
Removing Glaze from Carborundum Stones, 1169
Replantation or Implantation, 311
Resistance in Electric Furnaces, 1047

Save Your Money, 1069
Sealing Arsenic in Buccal Cavities, 98
Selecting Shades, 529
Selecting Teeth for Dentures, 856
Send in Your Hints, 432
Setting Saddle Bridges with Cement, 99
Skiagraphs as an Aid in Crowning Roots, 529
Sloughing Following Cocaine Injections, 957
Solution to Remove Stains of Silver Nitrate and Other Salts of Silver, 1293
Sterile Water, 1294
Sterilization of Instruments, 312
Successful Business Methods, 430
Suggestion, 194
Superiority of Gold Inlays, 1296

Taking a Bite, 527
Testing an Electric Furnace, 1049
The District Society, 1048
To Etch the Surface of a Gold Inlay, 649
To Insure an Even Mixing of Colors, 648
To Keep Hypodermic Needles from Rusting, 751
To Keep Your Flasks Clean, 648
To Polish Plates, 751
To Polish Rubber Plates, 309
To Prepare Aluminum Plates for Rubber, 309
To Prepare the Floor of the Cap for a Porcelain Crown, 527
To Remove Coating from Instruments After Boiling, 310
To Set an Inlay, 309
To Soften Calculus, 751
To Spur Aluminum Base Plates, 98
Tooth Brushes, 1171
Treating an Alveolar Abscess, 753
Treating Cavities with Nitrate of Silver, 528
Treating Putrescence in Roots, 1295
Treating Putrescent Pulps, 101
Treating Putrescent Pulps in Deciduous Teeth, 100
Treating Pyorrhea Cases, 311
Treatment of Burrowing Decay, 650
Treatment of Cavities Before Filling, 101
Treatment of Children in the Office, 858
Treatment of Erupting Teeth, 857
Treatment of Patients, 429

Uniform Fee Bill, 960
Use the Rubber Dam, 752
Utilize Your Worn Mandrels, 428

Why Porcelain Changes Color in Fusing, 429
Worn Mandrels, 309

OBITUARY.

Boak, J. S. 1298
Chappell, Milton H. 200
Chittenden, Charles C. 199
Crouse, D. Howard 201
Deming, Charles Perry 201
Freeman, Daniel B. 1298
Handley, Robert E. 755
Kay, William 1053
Lewis, Henry M. 314, 432
Taylor, Charles Richard 1051

IN MEMORIAM.

Chittenden, Charles C. 533, 860

CONTRIBUTORS TO PRACTICAL HINTS.

Abstein, C. E., Chicago, Ill.
Ames, W. V.-B., Chicago, Ill.
Arnold, L. H., Chicago, Ill.

Baldwin, C. M., Chicago, Ill.
Banzett, G. T., Chicago, Ill.
Banzhaf, H. L., Milwaukee, Wis.
Berry, F. H., Milwaukee, Wis.
Black, A. D., Chicago, Ill.
Black, G. V., Chicago, Ill.
Blair, E. K., Waverly, Ill.
Bloxton, Benj., Richmond, Va.
Brophy, T. W., Chicago, Ill.
Bullard, J. A., Chicago, Ill.
Byram, J. Q., Indianapolis, Ind.

Callahan ,J. R., Cincinnati, Ohio.
Campbell, B. C., Lake Geneva, Wis.
Carpenter, E. R., Chicago, Ill.
Case, C. S., Chicago, Ill.
Chilson, W. H., Appleton, Wis.
Cigrand, B. J., Chicago, Ill.
Clark, W. G., Chicago, Ill.
Conley, C. E., Le Seur, Minn.
Conzett, J. V., Dubuque, Iowa.
Cook, G. W., Chicago, Ill.
Corbey, G. F., Mattoon, Ill.
Crouse, J. N., Chicago, Ill.
Cummings, J. E., Chicago, Ill.
Custer, L. E., Dayton, Ohio.

Daly, T. H., Mt. Carmel, Ill.
Davis, H. E., St. Joseph, Ill.
Dittmar, G. W., Chicago, Ill.
Donelan, T. P., Springfield, Ill.

Elmer, A. J., Bloomington, Ill.
Evans, E. T., Decatur, Ill.

Farrand, C. H., La Crosse, Wis.
Fernandez, E. M. S., Chicago, Ill.
Franz, Hugo, Chicago, Ill.
French, E. C., Eau Claire, Wis.

Gallie, D. M., Chicago, Ill.
Gowan, W. C., Creemore, Can.

Hadley, C. J., Chicago, Ill.
Hanaford, L. A., Rockford, Ill.
Hardgrove, T. A., Fond du Lac, Wis.
Harlan, A. W., New York, N. Y.
Haskell, L. P., Chicago, Ill.
Haskins, G. W., Chicago, Ill.
Hayter, Mark, Dallas, Ore.
Helck, S. A., Grayville, Ill.
Hewett, A. C., Chicago Ill.
Holinger, Otts, Chicago, Ill.
Hoover, W. A., Gibson City, Ill.
Hughes, D. J., Palestine, Ill.

Jackson, H. N., Milwaukee, Wis.
Junkerman, G. S., Cincinnati, Ohio.

Kapitan, E. M., Manitowoc, Wis.
Kells, C. E. Jr., New Orleans, La.
Knapp, J. R., New Orleans, La.
Kyner, A. D., Moweaqua, Ill.

Latcham, H. E., Brainerd, Neb.
Lawrence, C. W., Bethany, Ill.
Lee, H. C., Chicago, Ill.
Leonard, J. P., Joliet, Ill.
Logan, H. G., Aurora, Ill.
Luthringer, J. P., Peoria, Ill.

McIntosh, F. H., Bloomington, Ill.
Maercklein, B. G., Milwaukee, Wis.
Marlow, G. C., Lancaster, Wis.
Martin, Oliver, Ottawa, Can.
Matteson, A. E., Chicago, Ill.
Monroe, Grafton, Springfield, Ill.
Moore, H. J., Frankfort, Ga.

Newell, V. B., Chicago, Ill.
Newkirk, Garrett, Pasadena, Cal.
Noyes, F. B., Chicago, Ill.

O'Keefe, W. E., Appleton, Wis.
Owre, Alfred, Minneapolis, Minn.

Pearce, R. M., Rock Island, Ill.
Penberthy, J. W., Minneapolis, Minn.
Perisho, V. P., Streator, Ill.
Perry, E. J., Chicago, Ill.
Powell, T. E., Chicago, Ill.
Pritchett, T. W., Whitehall, Ill.
Prothero, J. H., Chicago, Ill.
Pruyn, C. P., Chicago, Ill.

Reaben, W. H., Macomb, Miss.
Reeves, W. T., Chicago, Ill.
Reid, J. G., Chicago, Ill.
Richardson, U. M., Chicago, Ill.
Ritter, J. W., Charleston, Ill.
Robertson, W. A., Crookston, Minn.
Roach, F. E., Chicago, Ill.
Rohland, C. B., Alton, Ill.

Spence, S. J., Chattanooga, Tenn.
Strange, A. F., Litchfield, Ill.
Sullivan, W. B., Savannah, Ga.

Taggart, W. H., Chicago, Ill.
Taylor, C. R., Streator, Ill.
Taylor, J. B., Marshall, Ill.
Tennant, W. E., Fond du Lac, Wis.
Thiersch, Wm., Geneva, Switzerland.
Thompson, C. N., Chicago, Ill.
Trickey, F. S., Freeport, Ill.
Turner, C. R., Philadelphia, Pa.
Tweedle, W. H., Hopedale, Ill.

Waltz, J. F. F., Decatur, Ill.
Wassall, J. W., Chicago, Ill.
Weeks, T. E., Minneapolis, Minn.
Wells, J. O., Minneapolis, Minn.
Whitefield, G. W., Evanston, Ill.
Williams, J. B., Ashland, Wis.
Willman, A. C., Kankakee, Ill.

BIOGRAPHICAL INDEX.

Abstein, C. E., 859
Aguilar, F. A., 1242, 1245
Allen, A. B., 483
Allen, E. H., 682
Ames, W. V.-B., 31, 77, 100, 196, 1028, 1119, 1171
Arnold, L. H., 195, 527
Austin, J. F., 400

Babcock, C. L., 1249
Baldwin, C. M., 772, 942, 1047
Banzett, G. T., 148, 174, 309, 942
Banzhaf, H. L., 101, 165, 501
Bartlett, W. M., 398
Beck, Rudolph, 383
Bentley, C. E., 233, 736, 737, 835, 1143, 1150
Berry, F. H., 99
Black, A. D., 42, 310, 396, 505, 752, 838, 845, 956, 1012
Black, G. V., 1, 105, 162, 164 496, 624, 725, 737, 741, 804, 811, 839, 856, 924, 957
Blair, E. K., 791, 824, 851, 957, 982, 1005, 1168
Bloxton, Benj., 1295
Bodecker, C. F., 317
Bogue, Dr., 1244
Booth, C. N., 1259
Boutle, Dr., 1247
Bowman, G. A., 380
Brewster, Robert, 279
Brophy, T. W., 70, 74, 154, 311, 387, 404, 429, 558, 628, 704, 751, 807, 957, 1013, 1021, 1030, 1111, 1126, 1141, 1170, 1243, 1273, 1278, 1295
Brown, G. V. I., 1249
Buckley, J. P., 276, 285, 402, 1024, 1155
Bullard, J. A., 1016, 1169
Burroughs, E. L., 844
Byington, C. E., 1073, 1150
Byram, J. Q., 223, 285, 310, 338, 431, 485, 502, 530, 751

Callahan, J. R., 759, 810, 956
Campbell, B. C., 100
Capron, J. D., 905
Carpenter, E. R., 69, 256, 428, 1029, 1117, 1277
Case, C. S., 75, 271, 614, 713, 729, 858
Chambers, W. T., 1101
Chapman, John, 383
Chilson, W. H., 65, 124, 311
Cigrand, B. J., 619. 1003, 1168
Clack, Wm., 1256, 1263
Clark, W. G., 38, 196
Conlev. C. E., 751
Conzett, J. V., 553, 599, 604, 752
Cook, G. W., 72, 158, 262, 282, 429, 461, 709, 835, 839, 850, 958, 1036, 1115, 1126, 1145, 1152, 1156, 1277, 1294
Cook, T. F., 605
Cooper, W. M., 1242, 1246
Corbey, G. F., 902, 1048
Cross, H. A., 400
Crouse, J. N., 381, 528, 780, 826, 848, 1007
Cruise, R. J., 401
Cudworth, W. H., 1254, 1258, 1260
Cummings, J. E., 428
Custer, L. E., 878, 943, 1048

Daly, T. H., 474, 649
Damron, G. H., 259
Danforth, J. S., 67, 1260
Davis, H. E., 367, 529, 648
Davis, L. L., 76, 268, 716, 1028, 1118, 1272
Demo, W. A., 606
Dewey, Martin, 465
Diamond, P. T., 926, 1025
Dittmar, G. W., 507, 648, 802, 850, 1009
Donelan, T. P., 767, 960
Duncan, S. F., 588, 726
Dunn, J. A., 162, 593
Elliott, Dr. (of England), 399
Elmer, A. J., 34, 312, 1148
Evans, E. T., 751

Fahrney, S. W., 712
Farrand, C. H., 101, 197
Fawcett, A. C., 484
Fernandez, E. M. S., 386, 406, 508, 528, 650, 751
Franz, Hugo, 527
French, E. C., 195

Gallie, D. M., 98, 382, 499, 720, 799, 922, 956
Garhart, N. K., 891, 946
Geilfuss, E. A., 1210, 1262, 1264
Gilmer, T. L., 405, 459
Goodrich, C. H., 491
Goslee, H. J., 385, 1132
Gowan, W. C., 198, 530
Griswold, W. E., 270

Hadley, C. J., 649, 654
Hammond, J. F., 883, 944
Hampton, T. M., 384
Hanaford, L. A., 959
Hanaford, M. L., 828
Hardgrove, T. A., 67, 129, 166, 167, 173, 175, 176, 311, 666
Harlan, A. W., 1057, 1112, 1122, 1124, 1126, 1243, 1295
Harris, J. W., 603
Hart, E. J., 1253
Hartzell, T. B., 487, 488, 494
Haselden, C. P., 1193, 1245, 1247, 1248
Haskell, L. P., 99, 196, 309, 625, 856, 941, 1062, 1293
Haskins, G. W., 832, 933, 1011, 1169
Hayter, Mark, 855
Helck, S. A., 254, 430
Hewett, A. C., 1095, 1218, 1294
Hinkins, J. E., 272, 718, 1037, 1090, 1122, 1124, 1158, 1277
Hirschfeld, W., 1241
Holden, S. R., 479, 1267
Holinger, Otto, 739, 833, 959
Hoover, W. A., 53, 196, 1003, 1169
Houston, J. T., 476
Hughes, D. J., 135, 313

Jackson, Dr., 806
Jackson, H. N., 958
Jenkins, N. S., 1196, 1248
Jessen, Dr., 1246
Johnson, C. N., 71, 213, 266, 391, 497, 547, 601, 717, 722, 1001, 1032, 1037, 1068, 1112, 1270

Jones C. E., 685
Jones, C. R., 629
Jones, C. W., 483
Junckerman, G. S., 988, 1171

Kapitan, E. M., 59, 313
Kells, C. E. Jr., 352, 394, 407, 529
Kerfoot, G. O., 152
Knapp, J. R., 397, 528
Knowles, S., 382
Koch, C. R. E., 825, 915
Kremer, F. B., 486, 1267
Kyner, A. D., 247, 432

Lamberton, E. E., 599
Lancaster, H. N., 943
Latcham, H. E., 98
Lawrence, C. W., 137, 312
Lawrence, R. N., 742, 823
Lee, H. C., 527, 751
Leonard, J. P., 1050
Lewis, A. M., 566
Lewis, H. L., 393, 657
Logan, H. G., 238
Logan, W. H. G., 384, 394, 429, 837
Lourie, L. S., 716, 739
Lucas, C. D., 284
Luthringer, J. P., 963, 1015, 1170

Macdowell, J. N., 706
Maercklein, B. G., 66, 167, 174, 175, 312, 1263
Maercklein, R. E., 66, 173, 174
Marlow, G. C., 132, 313, 1261
Marsh, J. W., 1140
Martin, Oliver, 98, 194, 195, 314
Matteson, A. E., 527
McCrea, J. F., 286, 1230, 1270
McIntosh, F. H., 727, 859
McKee, W. A., 1019
McMillan, H. W., 830
Mead, C. M., 726, 742, 1010, 1147
Meyer, L. A., 1251
Miller, W. D., 1185, 1241, 1244
Monk, C. J., 1175
Moody, F. E., 492
Moore, H. I., 1172
Moore, H. J., 1248
Munroe, Grafton, 470, 649, 697, 743, 1047
Murray, W. N., 377, 380

Nevreze, Dr., of Paris, France, 1272
Newel, V. B., 651
Newkirk, Garrett, 649, 651, 654, 857, 957
Noyes, E., 722, 801, 907, 942
Noyes, F. B., 161, 195, 437, 483, 484, 486, 510, 529, 650
Nyman, J. E., 274, 807

O'Brien, H. J., 604
O'Keefe, W. E., 994, 1170
Orton, F. H., 378, 494
Ottolengui, R., 450, 510
Owre, Alfred, 344, 483, 488, 490, 539, 607, 648, 1267

Pearce, R. M., 731, 855
Peck, A. E., 375
Penberthy, J. W., 287, 443, 489, 493, 857, 1269
Perisho, V. P., 1294
Perry, E. J., 164, 268. 348, 390, 429, 627, 648, 710, 808, 856, 868, 1027, 1048, 1255, 1262, 1276
Perry, Leslie, 386
Pherrin, J. B., 603
Powell, T. E., 229, 430, 913
Pritchett, T. W., 264, 506, 841, 911, 1050
Prothero, J. H., 283, 623, 857
Pruyn, C. P., 257, 392, 501, 786, 842, 960

Rawlings, G. A., 745
Reaben, W. H., 652, 1050
Reeves, W. T., 98
Reid, J. G., 261, 431, 705, 809, 925, 931, 1035, 1037, 1113, 1275
Reinfreid, C. G., 68
Richardson, U. M., 56, 68, 197
Ritter, J. W., 972, 1025, 1170
Roach, F. E., 283, 388, 894, 936, 1049
Robertson, W. A., 668, 858
Robinson, C. H., 446, 484, 494
Rodolf, C. F., 62, 65, 166, 1254, 1260
Rohland, C. B., 724, 816, 958, 1130, 1136
Rosenquist, A. C., 608
Royce, E. A., 259, 1276

Shibley, Dr., 488, 491, 492
Sitherwood, G. D., 1019
Spence, S. J., 100
Stephan, L., 1261
Strange, A. F., 101
Sullivan, W. B., 1297

Talbot, E. S., 1199, 1252
Taylor, C. R., 269, 504, 723, 726, 734, 741, 752, 863, 1023, 1049
Taylor, F. G., 1104
Taylor, J. B., 899, 1047
Taggart, W. H., 379, 938, 1047, 1128, 1296
Tennant, W. E., 996, 1171
Tenney, L. S., 265, 979, 1037, 1038, 1114
Thiersch, Wilhelm, 1297
Thompson, C. N., 527, 1135
Todd, G. S., 601, 1269
Torrence, Dr., 849
Torrence, L. B., 1149
Trickey, F. S., 102
Turner, C. R., 573, 629, 751, 927
Tweedle, W. H., 1169, 1293

Walls, J. M., 745
Waltz, J. F. F., 1077, 1137, 1294
Warren, G. E., 741, 1015
Wassall, J. W., 256, 386, 430, 506, 648, 1121
Webster, G. O., 1243
Weeks, T. E., 481, 677, 744, 753
Wedelstaedt, E. K., 596
Wells, J. O., 242, 377, 378, 529, 606
Wenker, R., 67
Whipple, H. L., 1146
Whitefield, G. W., 99, 528
Williams, J. B., 198
Willman, A. C., 145. 309
Wood, Casey A., 1235, 1278
Woolley, J. H., 76, 205, 273, 703, 1030, 1037, 1125, 1272
Work, C. M., 1268
Wright, J. J., 1108
Wyndham, Horace, 775

Yerke, F. J., 609

LIST OF CONTRIBUTORS TO VOLUME XX.

Allen, E. H.	Freeport, Ill.
Ames, W. V.-B.	Chicago, Ill.
Baldwin, C. M.	Chicago, Ill.
Banzett, G. T.	Chicago, Ill.
Bentley, C. E.	Chicago, Ill.
Black, A. D.	Chicago, Ill.
Black, G. V.	Chicago, Ill.
Blair, E. K.	Waverly, Ill.
Bodecker, C. F.	Berlin, Germany.
Brophy, T. W.	Chicago, Ill.
Byington, C. E.	Harrisburg, Ill.
Byram, J. Q.	Indianapolis, Ind.
Callahan, J. R.	Cincinnati, Ohio.
Capron, J. D.	Menasha, Wis.
Chambers, W. T.	Denver, Col.
Chilson, W. H.	Appleton, Wis.
Clark, W. G.	Chicago, Ill.
Conzett, J. V.	Dubuque, Iowa.
Cook, G. W.	Chicago, Ill.
Corby, G. F.	Mattoon, Ill.
Crouse, J. N.	Chicago, Ill.
Custer, L. E.	Dayton, Ohio.
Daly, T. H.	Mt. Carmel, Ill.
Davis, H. E.	St. Joseph, Ill.
Dewey, Martin	Kansas City, Mo.
Donelan, T. P.	Springfield, Ill.
Duncan, S. F.	Joliet, Ill.
Dunn, J. A.	Chicago, Ill.
Elmer, A. J.	Bloomington, Ill.
Garhart, N. K.	Indianapolis, Ind.
Gilmer, T. L.	Chicago, Ill.
Geilfuss, E. A.	Milwaukee, Wis.
Hammond, J. F.	New York, N. Y.
Hardgrove, T. A.	Fond du Lac, Wis.
Harlan, A. W.	New York, N. Y.
Haselden, C. P.	Hamburg, Germany.
Haskell, L. P.	Chicago, Ill.
Helk, S. A.	Grayville, Ill.
Hewett, A. C.	Chicago, Ill.
Hinkins, J. E.	Chicago, Ill.
Hoover, W. A.	Gibson City, Ill.
Houston, J. T.	Peoria, Ill.
Hughes, D. J.	Palestine, Ill.
Jenkins, N. S.	Dresden, Germany.
Johnson, C. N.	Chicago, Ill.
Jones, C. E.	Chicago, Ill.
Junkerman, G. S.	Cincinnati, Ohio.

Kapitan, E. M.	Manitowoc, Wis.
Kells, C. E., Jr.	New Orleans, La.
Kerfoot, G. O.	Batavia, Ill.
Kyner, A. D.	Moweaqua, Ill.
Lawrence, C. W.	Bethany, Ill.
Lewis, A. M.	Austin, Minn.
Lewis, H. L.	Chicago, Ill.
Logan, H. G.	Aurora, Ill.
Luthringer, J. P.	Peoria, Ill.
McCrea, J. F.	Minneapolis, Minn.
Marlow, G. C.	Lancaster, Wis.
Miller, W. D.	Berlin, Germany.
Monk, C. J.	Wiesbaden, Germany.
Monroe, Grafton	Springfield, Ill.
Noyes, F. B.	Chicago, Ill.
O'Keefe, W. E.	Appleton, Wis.
Ottolengui, R.	New York, N. Y.
Owre, Alfred	Minneapolis, Minn.
Penberthy, J. W.	Minneapolis, Minn.
Perry, E. J.	Chicago, Ill.
Powell, T. E.	Chicago, Ill.
Pruyn, C. P.	Chicago, Ill.
Richardson, U. M.	Chicago, Ill.
Ritter, J. W.	Charleston, Ill.
Roach, F. E.	Chicago, Ill.
Robertson, W. A.	Crookston, Minn.
Robinson, C. H.	Wabasha, Minn.
Rodolf, C. F.	Muscoda, Wis.
Talbot, E. S.	Chicago, Ill.
Taylor, C. R.	Streator, Ill.
Taylor, F. G.	Neenah, Wis.
Taylor, J. B.	Marshall, Ill.
Tennant, W. E.	Fond du Lac, Wis.
Tenney, L. S.	Chicago, Ill.
Turner, C. R.	Philadelphia, Pa.
Waltz, J. J.	Decatur, Ill.
Weeks, T. E.	Minneapolis, Minn.
Wells, J. O.	Minneapolis, Minn.
Willman, A. C.	Kankakee, Ill.
Wood, Casey A.	Chicago, Ill.
Woolley, J. H.	Chicago, Ill.
Wright, J. J.	Milwaukee, Wis.
Wyndham, Horace	London, England.

TABLE OF CONTENTS.

ORIGINAL COMMUNICATIONS.

A Comparison of Beginning and Burrowing Cavies 437
A Feature of Pyorrhea Treatment 31
A Few Experiments With Gold 979
A Few Reasons Why Inlays Should be Used in Posterior Teeth 132
A Plea for the More Conservative Use of Anesthetics, Narcotics, and Sedatives in Dental Practice 786
A Strange Phase Against Extension for Prevention 566
A Year's Progress in Porcelain Prosthesis 1196
Acute Ulcerous Gingivitis 459
An Extensive Case of Restoration 593
Anesthesia 247, 996
Atrophied Teeth 1, 105
Baking Porcelain with Partition Wall 772
Better Therapeutic Education of Dentists 443
Care of the Eyes and Eyesight by Members of the Dental Profession 1235
Cleanliness 553
Cleanliness a Duty to Our Patrons 59
Cleanliness in Dentistry 474
Concerning the Porcelain Inlay 1077
Dental Education in the Public Schools 1073
Dental Fees 124
Dental Prosthesis as Applied Science 573
Dentists in Paris 775
Dentistry as a Business 254
Echinacea Purfurea, Echinacea Angustifolia, Echafolta 1095, 1218
Electric Furnaces 883
Enamel of the Teeth Decalcified 317
Ethics 344
Etiology and Treatment of Pyorrhea Alveolaris 905
Evolution and Decay of the Tooth Brush 988
Extension for Prevention 135
Extirpation of the Pulp and Filling the Root Canals 470
Extracting Impacted Lower Third Molars 1101
Failure of Fillings 53
From a Microbe's Point of View 352
Gold Filling 34, 889
Gold Inlays 38
Harmony 767
Harmony in the Dental Profession 982
Helpful Hints 145
Herbst Burnishers 759
Interstitial Gingivitis Due to Antointoxication. Etiology 1119
Membership vs. Non-Membership of the Local Society 791
Methods and Means 367
On the Composition of the Dentine and Enamel of Human Teeth 1090
Our Strongest Weakness 963
Our Younger Patients 697
Pathologic Infant Dentition 1210
Porcelain Inlays 148
Preparation of Cavities in Proximal Surfaces of Incisors Involving the Loss of the Incisal Angle 539
President's Address 205, 242, 476, 588, 666, 1108, 1175
Pressure Anesthesia and Arsenic 994
Pyorrhea Alvolaris 129
Pyrometer Furnaces 891
Reflex Neuroses 668
Relative Food values 229
Reminiscences of Forty Odd Years of Practice 780
Removing Pulp with Local Anesthetics and Eucaine by Pressure Anesthesia 152
Renoform As a Local Anesthetic 1193
Report of Committee on Dental Art and Invention 685
Report of Committee on Dental Science and Literature 682
Roach's Moldable Porcelain 868
Roach's New Opaque Dental Porcelain 348
Sixty-two Years of Dentistry 1062
Some Needs of Dental Societies and Their Members 1230

Some Phenomena Observed in Fusing Porcelain........ 223
Some Possibilities of the District Society........ 902
Some Principles in Furnaces........ 894
Somnoform; Its Use and a Few Personal Experiences with It........ 972
Sterilization and Disinfection as Related to Water, Intsruments and Soft Tissues, Including Putrescent Pulps........ 1057
The Bandless Porcelain Crown........ 56
The Color Problem in Porcelain Inlays........ 338
The Dental Society a Necessary Factor in Professional Growth........ 137
The Dental Society: Its Objects, Advantages and Organization........ 677
The Duties and Obligations of the Members of the State Boards of Dental Examiners........ 863
The Essentials in Electric Oven Construction........ 878
The Inlay Principle as Adapted to Individual Porcelain Crowns........ 62
The Intermaxillary Anchorage of Orthodontia........ 465
The Larger Vision........ 1068
The Minnesota State Board of Dental Examiners........ 446
The Necessity for a Chair of Oral Surgery in the Medical Cirriculum........ 233
The Necessity for Greater Intelligence in Performing Dental Operations........ 549
The Possibilities of a Professional Career........ 213
The Role Played by Certain Acid Derivatives of Lactose in the Erosion of Teeth.. 461
The Use of the X-Ray in Dentistry........ 657
Treatment of Fracture of the Inferior Maxillary Bone........ 42
Treatment of Patients and Dentists........ 238
Treatment of Sensitive Dentine, The, with Special Reference to the Production of Anesthesia by Pressure........ 1185
What Does the Dental Profession Most Need?........ 558
What We Lack........ 1104
Why and How I Fill Children's Teeth with Gold........ 450

PROCEEDINGS OF SOCIETIES.

American Dental Society of Europe........ 1241
Black, G. V., Dental Club........ 596
Chicago-Odontographic Society........154, 274, 391, 496, 614, 798, 938
Illinois State Dental Society........720, 811, 906, 1001, 1128
Minnesota State Dental Association........375, 479, 1267
North Dakota Dental Association........ 744
Odontological Society of Chicago........69, 256, 379, 703, 1027, 1110, 1270
Southern Wisconsin Dental Society........ 1249
Wisconsin State Dental Society........65, 165

SOCIETY DISCUSSIONS.

A Comparison of Beginning and Burrowing Caries........ 481
A Feature of Pyorrhea Treatment........ 69
A Few Experiments with Gold........ 1027
A few Reasons Why Inlays Should be Used in the Posterior Teeth........ 1253
A Plea for the More Conservative Use of Anesthetics, Narcotics and Sedatives in Dental Practice........ 828
Atrophied Teeth........ 154
Better Therapeutic Education of Dentists........ 486
Care of the Eyes........ 1270
Clinics of the G. V. Black Dental Club........ 596
Composition of the Enamel and Dentine of Human Teeth........ 1152
Concerning the Porcelain Inlay........ 1128
Copper Sterilization: Its Application to Dental Instruments, Etc........ 1110
Dental Education in the Public Schools........ 1140
Dental Fees........ 165
Electric Furnaces........ 938
Ethics........378, 479
From the Microbe's Point of View........ 391
Herbst Burnishers and Gold Fillings........ 798
Interstitial Gingivitis Due to Antointoxication........ 1249
Membership vs. Non-Membership of the Local Society........ 791
Our Strongest Weakness........ 1001
Our Younger Patients........ 727
Pathologic Infant Dentition........ 1261
President's Address........256, 720, 1267
Prosthetic Dentistry as Applied Science........ 614
Pyorrhea Alveolaris........ 166
Pyrometer Furnaces........ 938
Reflex Neuroses........ 744

Reminiscences of Forty Odd Years of Practice........ 811
Renoform As a Local Anesthetic........ 1245
Report of Committee on Dental Sciencec and Literature........ 726
Roach's Moldable Porcelain........ 931
Roach's New Opaque Dental Porcelain........ 379
Somnoform: Its Uses and a Few Personal Experiences with It........ 1016
Some Phenomena Observed in Fusing Porcelain........ 274
Some Principles in Furnaces........ 938
The Bandless Porcelain Crown........ 65
The Color Problem in Porcelain Inlays........ 375
The Duties and Obligations of the Members of the State Boards of Dental Examiners........ 906
The Essentials in Electric Oven Construction........ 938
The State Board of Dental Examiners........ 490
The Treatment of Sensitive Dentine........ 1241
The X-Ray in Its Application to Dentistry........ 703
Why and How I Fill Children's Teeth with Gold........ 496

EDITORIALS.

A Barefaced Misrepresentation........ 853
A Certain Phase of Professional Ethics........ 1040
A Personal Protest and Warning........ 514
Army and Navy Legislation........ 513
Colleges and State Boards........ 631
Concentration........ 289
Death of Dr. C. R. Taylor........ 1042
Our New Cover........ 79
Public Supervision of the Dental Diseases of Children........ 177
Relief for San Francisco........ 633
Suitable Neckwear for Dentists........ 1161
The Cause of Erosion........ 513
The Dental Review for 1907........ 1282
The Fiftieth Anniversary of the St. Louis Dental Society........ 1281
The Illinois State Dental Society........ 632
The Value of Dental History........ 949
The Value of Local Dental Societies........ 746
To Crown or Not to Crown........ 410

EDITOR'S DESK.

Editor's Desk........ 80, 179, 290, 411, 516, 634, 747, 950, 1043, 1162

DOMESTIC CORRESPONDENCE.

Letter from Bernard Bramm........ 1166
Letter from J. R. Callahan........ 1054
Letter from J. W. Cormany........ 1289
Letter from E. C. Kirk........ 644
Letter from G. Alden Mills........ 1174
Letter from Garrett Newkirk........ 645
Letter from New York........ 87, 187, 296, 418, 523, 639, 749, 952, 1290
Letter from T. W. Pritchett........ 1053
Letter from B. L. Thorpe........ 1054

REVIEWS AND ABSTRACTS.

A System of Dental Surgery........ 1288
Orthodontia or Malposition of the Human Teeth: Its Prevention and Remedy........ 86
The American Illustrated Medical Dictionary........ 1288
The Teeth and Their Care........ 951
The World's Anatomists........ 418
Transactions of the Fourth International Dental Congress, Vol. III........ 418

CLINICS.

Black, The G. V. Club........ 202, 596
Chicago College of Dental Surgery........ 103
Kansas City Dental Society........ 436

DENTAL COLLEGE COMMENCEMENTS.

Chicago College of Dental Surgery.......758
College of Dentistry, University of Illinois.......757
Indiana Dental College.......757
Louisville College of Dentistry.......962
North Pacific Dental College.......757
Northwestern University Dental School.......962
Ohio College of Dental Surgery.......758
Philadelphia Dental College.......962
Royal College of Dental Surgeons.......758
State Dental College (Dallas, Tex.).......757
University of Michigan, College of Dental Surgery.......859
Western Dental College.......757

DENTAL SOCIETY ANNOUNCEMENTS.

American Dental Society of Europe.......102, 434
American Society of Orthodontists.......314
Barnes Dental College.......202, 316
Black, G. V. Dental Club.......102, 202, 1056, 1299
Chicago College of Dental Surgery, Alumni Association.......1298
Colorado State Dental Association.......860
Delta Sigma Delta Fraternity.......960
Federation Dentaire International.......756
First District Dental Society of Illinois.......1172
Georgia State Dental Society.......531
Idaho Board of Dental Examiners.......531, 960
Illinois State Board of Dental Examiners.......436, 534, 1056, 1174
Illinois State Dental Society.......103, 433
Indiana State Dental Association.......315
Institute of Dental Pedagogics.......316, 1072
Interstate Dental Fraternity.......653, 755
Iowa State Board of Dental Examiners.......653, 1055, 1298
Iowa State Dental Society.......433
Kansas City Dental Society.......436
Kansas State Dental Association.......434
Kentucky State Board of Dental Examiners.......1172
Kentucky State Dental Association.......315, 532
Michigan State Board of Dental Examiners.......316
Minnesota State Board of Dental Examiners.......315, 653, 960, 1054
Minnesota State Dental Association.......315
Mississippi Dental Association.......434, 860
Missouri State Dental Association.......434, 860
Montana State Board of Dental Examiners.......755
National Association of Dental Examiners.......434
National Association of Dental Faculties.......652
National Dental Association.......861, 1173
New Jersey State Board of Registration and Examination in Dentistry.......531, 1055
New Jersey Southern Dental Society.......532
New Jersey State Dental Society.......533
New York State Dental Society.......316, 435
North Nebraska Dental Association.......314
Northern Illinois Dental Society.......1054
Northern Indiana Dental Society.......960
Northern Iowa Dental Society.......960
Ohio State Board of Dental Examiners.......531, 1055
Ohio State Dental Society.......103, 1073
Orthodontia Club of Iowa.......531
Philadelphia Dental College.......532
Pennsylvania State Board of Dental Examiners.......531, 1298
Rochester Free Dental Dispensary.......861
South Dakota State Board of Dental Examiners.......653, 1298
Southern Illinois Dental Society.......1055
St. Louis Dental College.......532
St. Louis Dental Society.......961
St. Louis Society of Dental Science.......755
Swiss Odontological Society.......755
Texas State Dental Association.......859
Washington University, Dental Department.......531
Wedelstaedt, E. K. Club of Iowa.......652
West Virginia Board of Dental Examiners.......652
Wisconsin State Board of Dental Examiners.......103, 653
Wisconsin State Dental Society.......652
Wyoming State Board of Dental Examiners.......203

THE

DENTAL REVIEW.

VOL. XX. CHICAGO, JANUARY 15, 1906. No. 1

ATROPHIED TEETH.*

BY G. V. BLACK, M. D., D. D. S., CHICAGO.

ILLUSTRATIVE PHOTOGRAPHY BY DR. F. B. NOYES.

The term "atrophy" seems to include two distinct ideas; the one is a wasting of a part because of a local failure in the nutritive processes, the other is a failure of the development of a local part because of a failure of nutrition. Atrophied teeth belong to the second class; they have never been fully formed. They come through the gums in the condition of deformity in which they are afterward seen and do not, as some seem to suppose, waste away after having taken their places in the arch. The deformity is a result of incomplete formation. The term hypoplasia has of late been widely used in the German language in the same sense, and is being adopted by some writers in English.

In the human teeth there is no process of repair and the deformity is permanent. Similar phenomena occur in the finger nails and the hair. During an illness that interferes seriously with nutrition the portion of the finger nail then forming will be dwarfed, which will appear later as a groove across the nail. This, like the marking of the teeth, is not remedied by any reparative process. But the nail is continuously growing and the groove moves on over the length of the nail and disappears.

During a severe illness a section of hair is imperfectly formed, and when in the process of growth this section arrives at the surface of the skin and is subjected to bending, it breaks and the hair suddenly falls away. This is a common phenomena following severe cases of typhoid fever. The hair follicles are not injured and the hair is replaced by the regular process of growth.

---

* Read before the Chicago-Odontographic Society, October, 1905.

NOTE.—The portion of this paper descriptive of the outward appearances of atrophied teeth and the etiology, was published in the *Northwestern Dental Journal,* September, 1904, but it is believed best to present the whole as one paper now.

In the continuous growing teeth of the rodents such an injury would be finally removed and remedied in the same way as the grooving seen upon the finger nails, but this can not occur in the human teeth.

The deformity, though much varied in different cases, is, when closely analyzed, always similar in character. It always consist in the failure of the formation or an imperfect formation of some specific portion of the tooth and of several teeth together. The portions of the several teeth affected is always that portion of each that was in process of formation or growth at the same period in the person's existence. To understand this well one should study closely the calcification of the crowns of the teeth and the contemporaneous lines of calcification of the different teeth. This will be more fully explained in considering the histological changes occurring in atrophy. In the incisors the deformity is oftenest seen in the form of a groove, or a pitted groove, running across the labial surface from mesial to distal, and close inspection will generally show that it encircles the tooth completely, though it is most prominent upon the labial surfaces where the enamel is thickest. It is seen more often on the incisal half of the length of the crown. It may be near the cutting edge of the tooth or anywhere from that point toward the gingival line. It is also found occasionally in the roots of extracted teeth. There may be a single groove or pitted line, or there may be two or even three of these. The teeth affected are the incisors, cuspids and first molars of the permanent set, and very rarely the first bicuspids. If it is very close to the cutting edge on the central incisors it may not appear on the laterals, but the occlusal surfaces of the first molars will be atrophied. This is because these parts of these teeth are in process of formation at the same time. If the groove is a little further removed from the incisal edge of the centrals, the lateral incisors will also be similarly affected. If it is a little higher still, the four incisors, upper and lower, the cuspids and the first molars will be affected, but the bicuspids will be free from injury. It is exceedingly rare that the bicuspids or the second or third molars are affected by atrophy, for the reason that the enamel and dentine of these teeth generally have not begun to form until after the age at which these effects are most liable to occur. I have seen but few cases in which the first bicuspids were marked. The time of the occurrence of these injuries seems to be confined mostly to the first five years of a child's life, but some cases occur later.

In the engravings which accompany this article I have endeavored to illustrate some of the more severe types of these deformities. Fig. 1 represents what is known as the typical Hutchinson tooth, from the claims of Mr. Hutchinson, a specialist in venereal diseases in London, England, who insisted that this deformity was the result of inherited syphilis. In this case it has formerly been supposed that the middle lobe has failed of formation, resulting in this peculiar scar, but more recent investigation seems to show that the whole incisal edge has failed in most of these cases, and that the angles of the tooth have been drawn together over the injury, giving the outline of the tooth this rounded appearance. Certainly many of these teeth are much shorter than normal. Generally an ugly deformity of the occlusal surfaces of the first molars accompanies this type. In the molars there is likely to be little spiculæ of cusps sticking up much too close together, while the rest of the occlusal surfaces are much too small, crumpled together and sunken into the crown, which, other than this, will be of full size and form. These teeth decay quickly in case there is a tendency to caries in the individual.

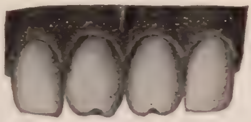


Fig. 1. Atrophy of the cutting edge of the central incisors, forming a central notch or scar. This is usually called "Hutchinson's tooth."

This and others up to and including No. 7 are photographed from India ink drawings.

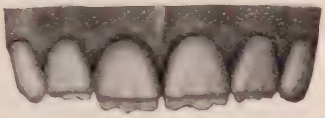


Fig. 2. Atrophy of the cutting edge of the central and lateral incisors.

In the incisors, only the centrals are affected. The calcification of the cutting edges of these I have occasionally found just begun at birth, and if not begun then is usually begun within one year. The injury, therefore, occurs soon after the birth of the child from some cause which interferes with nutrition. A very curious fact in pathology is rendered prominent in this form of atrophy. It is this: when the nutrition of any single part of the enamel organ is so impaired that its function is stopped or very seriously disturbed, that particular part does not recover, and no additional growth of enamel occurs on that part. This will appear more prominently in the histological specimens. It is for this reason that these teeth have that peculiar rounded appearance of the cutting edge. The enamel organ of that part is arrested in its work at the very beginning, and therefore the immediate incisal edge fails entirely. The rest of the organ goes on with its work after the recovery and the tooth is drawn in over the scar. In the incisors this form of atrophy is apt to be attacked by decay in this incisal pit very soon after the teeth have taken their places in the arch. They should be filled at once if decay is discovered.

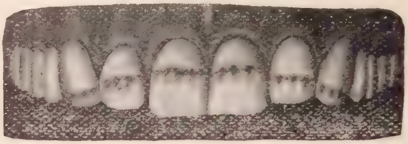


Fig. 3. Atrophy marks on the incisors and cuspids.

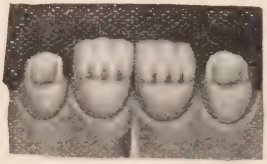
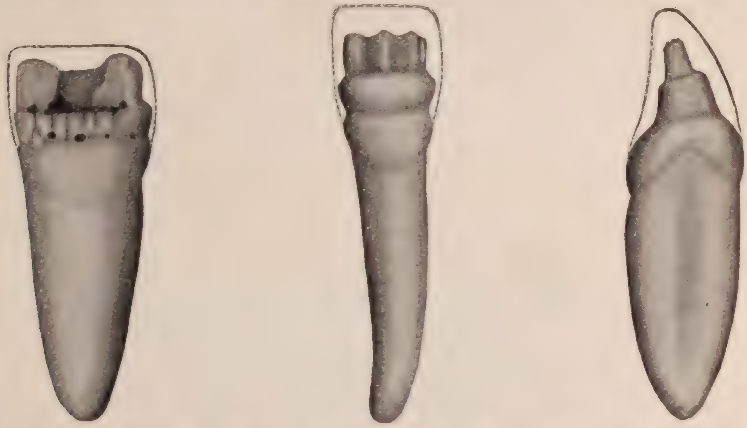


Fig. 4. Atrophy marks on the incisors, showing the inverted finger nail scar on the laterals.

This particular form of atrophy is seen less frequently than others.

The occlusal surfaces of the first molars are occasionally seen badly atrophied when the incisors have escaped. Usually these have just begun their calcification at birth, and occasionally the calcification of the central incisors does not begin for one year after birth. In this case a severe illness may injure the molars and not injure the incisors.

Much the more common forms are those illustrated in Figs. 2 and 3, the illustrations showing rather bad cases. In Fig. 2 the deformity is confined to the cutting edges, apparently, of the central and lateral incisors above and below, and the four first molars. In the case here illustrated the whole of the incisal edge of the incisors is dwarfed and shortened. This dwarfed portion ends abruptly toward the gingival. This is common in these cases. In many there is more or less rounding down of the well-formed part of the crown to the de-



Figs. 5, 6 and 7. Single teeth, the crowns of which have been badly dwarfed by atrophy. Each of these shows two zones of injury. The dotted lines are intended to show the normal outline of the crowns. Figs. 5 and 6 are different views of the same tooth.

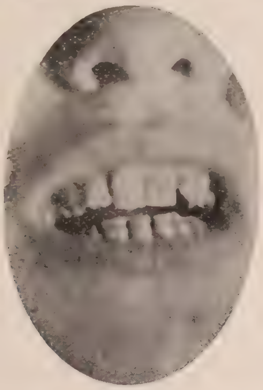


Fig. 8. Atrophy of incisors and cuspids showing no discoloration. Photographed direct from mouth of girl eighteen years old.

formed part, but often it is so abrupt as to form a square shoulder along which there is apt to be a series of sharp, deep pits. In the case from which this illustration is taken there are no pits whatever, and the deformity consists purely in the dwarfing of the incisal edges. But the whole of the occlusal surfaces of the molars was in very bad condition because of dwarfing that presented many abrupt fissures in which decay began almost immediately after they had come through the gums. In such cases as this the appearance of the teeth may be much improved by grinding away the dwarfed portion and shortening the cuspids a little to correspond with them. The teeth may appear a little short, but that is sometimes much less noticeable than the blemish.

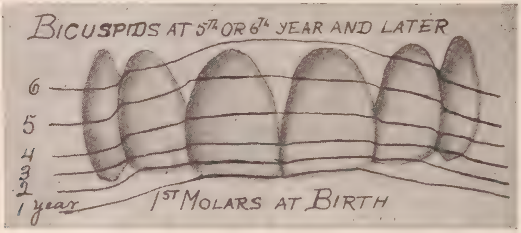


Fig. 9. Diagramatic index to the age at which atrophic injuries to the teeth have occurred.

In other cases occurring in the same locality and affecting the same teeth there may be but little dwarfing of the incisal edges of the incisors. The effect may be but a slight groove that may be smooth or more or less pitted, or in cases of a still milder type the distinct groove may be lacking and a row of fine pits in the enamel will be the only deformity. Generally, the effect is more marked in the occlusal surfaces of the first molars than in the incisors.

In the case illustrated in Fig. 3 the injury has occurred later, beginning when the child was between three and four years old. The incisal portion of the incisors had already been formed, and, therefore, there is no dwarfing of this portion of the tooth. But there is a very marked groove encircling the crowns of the incisors and cuspids marked with pits, with smoothly rounded bottoms. Both the groove and the pits in the groove are abrupt toward the gingival and thin away toward the incisal. This is a constant characteristic of these deformities, which will be readily understood by a study of the histological sections and the calcification lines of Retzeus. The circular form of this deformity, as it passes from tooth to tooth across the front of the mouth, is well marked; indeed, it presents rather more of the circular form than usual, indicating especially that the cuspids were a little later than usual in their calcification, and for that reason the mark is nearer the incisal edge in proportion to the position on the incisors than it would otherwise have been.

It is not frequent that we see so severe a mark as here shown so high upon the labial surfaces of the incisors. It seems to be a general rule that the higher upon the teeth the less marked is the deformity. Pretty generally, in this position on the centrals, the mark is a shallow groove, more or less pitted, or a row of pits without a distinct groove. In all of these cases the lower teeth bear marks similar to those in the upper.

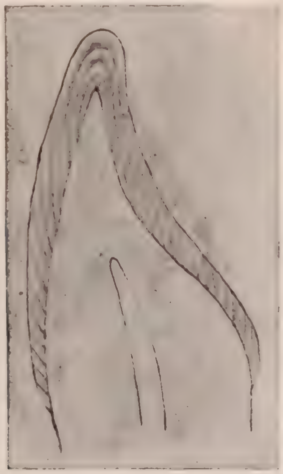


Fig. 10. Diagramatic illustration of the lines of Ritzeus, or incremental lines of the enamel, showing their direction in the different portions of the enamel cap.

In Fig. 4 I have illustrated a case that is somewhat out of the usual form in several particulars. When the impression for the cast from which the illustration was made was taken, the cuspids had not come through the gums, but one of the first bicuspids had erupted, and, to my surprise, showed a deep mark encircling the point of the buccal cusp. Also the history of the case shows that the lateral incisors did not erupt for nearly two years after the centrals had taken their places. In the centrals the incisal edges are fully formed, but there is a deep groove with rounded pits encircling the crowns at nearly mid length, while nearly the whole incisal half of the laterals is badly deformed. This indicates that the beginning of the calcification of these teeth was late, as compared with that of the centrals. This particular form of deformity of the lateral incisors is not very frequent, but yet a considerable number have been seen, quite enough to indicate a tendency to this particular deformity. In the common vernacular this has been called the *inverted finger nail deformity.* If we imagine the finger nail taken up and turned with the convex side down and set back in the end of the finger, we would have something very like this deformity. The whole appearance of this case at the time of my observation of it, indicated unusual irregularity of the time of calcification and eruption of the different teeth. The first

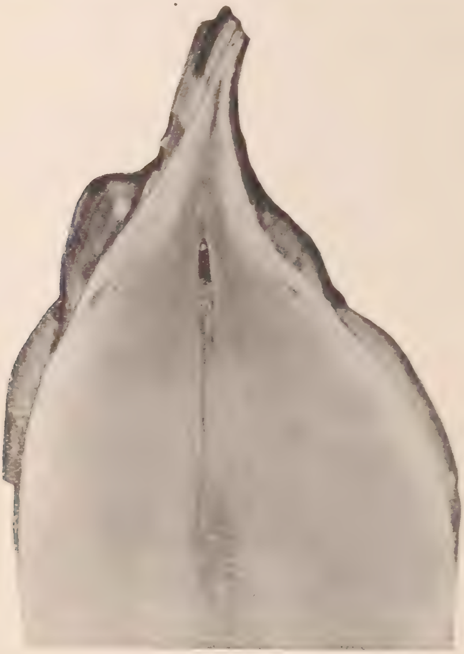


Fig. 11. Section of an incisor showing two zones of atrophy, or two grooves in section. Magnified eight diameters.

molars, both above and below, had already been destroyed by decay, beginning in the deformity of the occlusal surfaces.

Figs. 5 and 6 show a lower incisor with a double deformity. Fig. 5 is a view of the labial surface, and Fig. 6 of the mesial surface. The dotted lines show the normal tooth form. The two, taken together, show the extent of the dwarfing of the crown of the tooth. In this case the surface of the enamel was smooth and without pits.

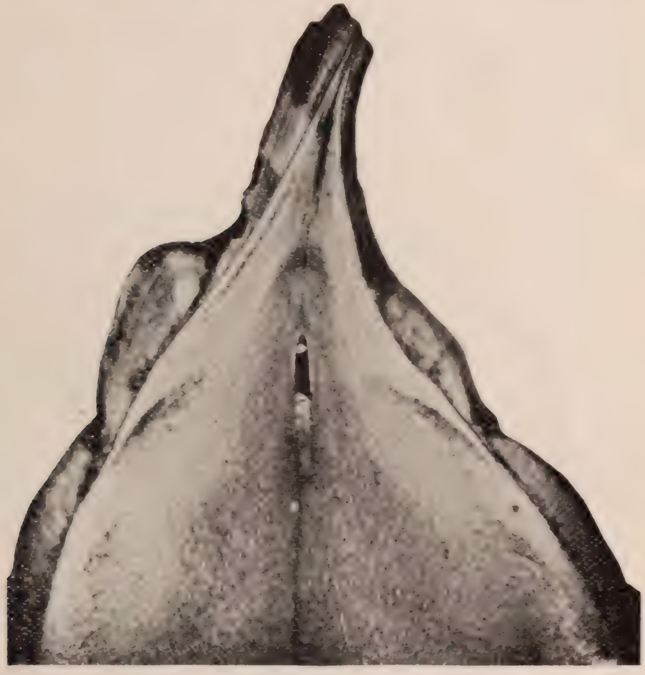


Fig. 11½. Same as No. 11, but with greater amplification.

Fig. 7 shows an upper central very badly deformed. This is also a double deformity and was further injured by decay starting in pits in the abrupt portion of the groove nearest the incisal. The sharp, deep pits shown along the line of the second groove have not been caused by decay, but were there when the tooth came through the gums. These teeth are from different persons, and in both cases were extracted in order to remedy the defect with artificial teeth. This seems to have been done under the mistaken notion that the roots of the teeth would not be good for artificial crowns. This was wrong. Extended observation shows that the roots of such teeth are as apt to be well developed and good for crowning purposes as those of any other teeth. And when the crowns are so badly deformed as to render such proceedings necessary, artificial crowns should be resorted to rather than the removal of the teeth. There is a hope that in the future such teeth may be restored to a comely appearance by means of porcelain. In case the crowning involves the removal of the pulp, this should be delayed as long as possible in order that the roots may be fully formed and the apical foramen reduced to a small size. One should wait until the patient is sixteen to eighteen years old, and twenty would be still better. In many cases of considerable actual deformity of the teeth from atrophy the color remains very perfect, and in this case, if the incisal edges of the incisors are fairly complete, the deformity is not prominently noticeable, as is shown in Fig. 8, from a photograph taken directly from the mouth.

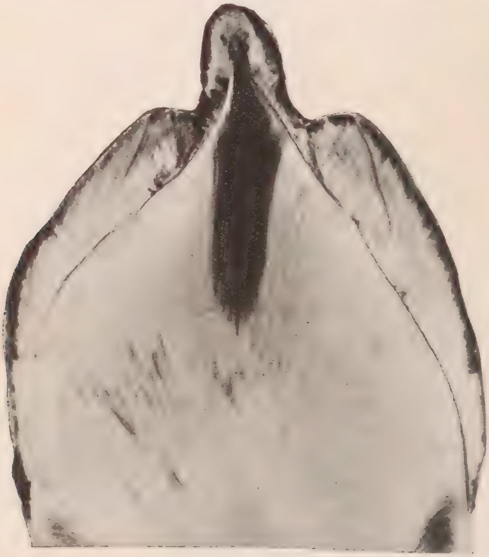


Fig. 12. Section of a cuspid showing a single very severe zone of atrophy, or a single groove in section. Magnified eight diameters.

ETIOLOGY.

Atrophy of the teeth is always caused by some illness that has interfered with nutrition at the time the particular parts of the teeth affected were in process of calcification. My attention was strongly called to this through a controversy between Hutchinson, of London, and Magitot, of Paris, who took opposite views some thirty or forty years ago. From Mr. Hutchinson's observations he was led to believe at first that all of these cases of atrophy were caused by inherited syphilis, while Dr. Magitot had come to the conclusion that they were due to eclampsia. This controversy led to a closer study of this whole subject, and finally Mr. Hutchinson yielded the point so far as to say that inherited syphilis was a frequent cause, and for many years held that the type which I have figured in Fig. 1 was always caused by inherited syphilis. That form, therefore, has been called the Hutchinson tooth. As showing how errors are liable to be perpetuated, most of the books on general medicine, surgery and venereal diseases, which mention these deformities at all, ascribe them to inherited syphilis, following the first writings of Hutchinson without further investigation. They are continually accusing innocent persons of crime.

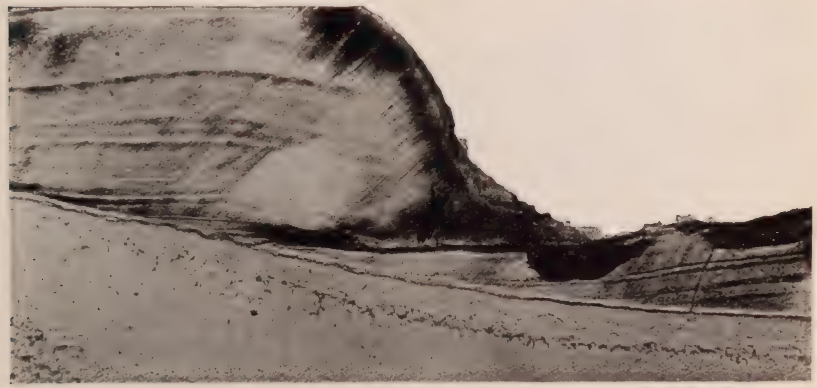


Fig. 13. Atrophy. A portion including the first zone of injury on the labial, i. e., that nearest the incisal edge, from the same section shown in Fig. 11, photographed with a higher magnification. In this the lines of Ritzeus may be seen in the enamel; the dark line of junction between the enamel of first formation and enamel of second formation, reaching from the dento-enamel junction, with the enamel of second formation overlapping that of the first; also the line of interglobular spaces in the dentine, running almost parallel with the line of dento-enamel junction.

I have followed this subject pretty carefully ever since Hutchinson wrote, adding observation after observation until I have arrived at the conclusion that there is no special form of disease that is especially blamable for this affliction, but that any form of disease that seriously interferes with nutrition is liable to bring about this result, i. e., that it is not the particular form of disease, *but that it is the condition of mal-nutrition that is the cause,* no matter what the disease which has induced that condition. I have seen several cases of typical Hutchinson teeth that were certainly in no way connected with a syphilitic taint of any kind.

Some of these observations may be of interest. Mr. and Mrs. B., whom I had known intimately from childhood, had a child which seemed healthy at birth, but soon afterward became anemic and did very badly for two years. Growth was a failure during that time, and it was with great difficulty that the child was kept alive. In its third year, however, the child recovered and become strong and healthy and developed well. When the permanent teeth came through the gums nearly the incisal third of the centrals and laterals was badly dwarfed, the points of the cuspids had failed and the occlusal surfaces of all of the first molars were badly atrophied.

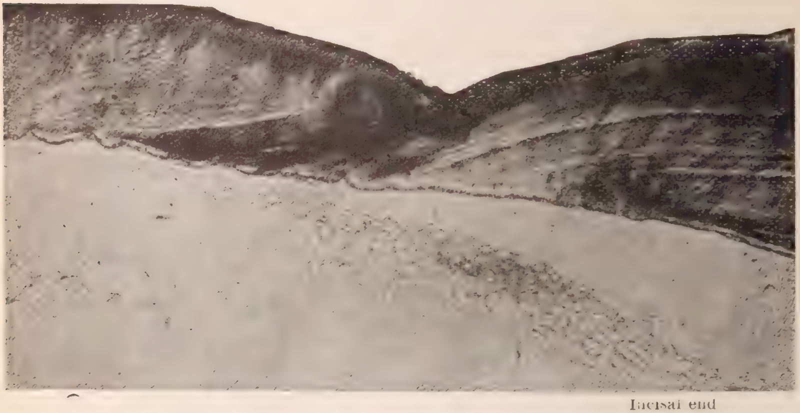


Fig. 14. Atrophy. A portion including the second zone of injury seen in Fig. 11, with a higher magnification. In this position the lines of Ritzeus diverge more sharply from the direction of the line of the dento-enamel junction, and the overlapping of the third growth of enamel onto the second is shorter. The discoloration is greater. The line of interglobular spaces is broader, and in this position diverge more sharply from the line of the dento-enamel junction. Otherwise it is similar in plan with the first zone of injury shown in Fig. 13.

In another case a kinswoman was visiting at my house with a little girl two and a half years old. The child had not seemed very well of late, though she showed no particular form of illness. She would play much of the time, but seemed to get very tired. One day I was suddenly called to her and found her apparently dead, a condition that had been preceded by a violent clonic spasm. I instituted artificial respiration at once, and after a few moments there was a sigh and directly another, and within a few minutes the respiration and circulation was re-established. The child dropped to sleep almost immediately, while yet in my arms, and seeing that the breathing was sufficiently full and regular, I laid her on a couch, left her mother to watch her and went back to my business. She slept three hours, and when she awoke she was ready to play again. She remained rather dull for another month, when the condition seemed to pass away. There was but the one spasm. But when the permanent teeth came through they were deeply marked, corresponding with the time of this occurrence.

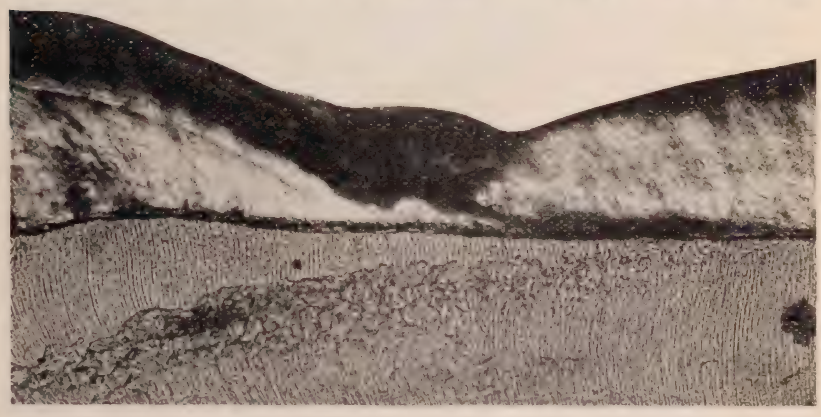


Fig. 15. Atrophy. The second zone of injury on the lingual side from the section shown in Fig. 11. It will be seen that while differing slightly in detail, all of its parts are similar to the portions shown in figures 13 and 14.

I attended a child two and a half years old through a severe case of typhoid fever. When the permanent teeth came through they were marked with a deep groove, irregularly pitted, similar to Fig. 3, but not so high up on the crowns.

An English woman brought her child to me on account of a very ugly marking of the incisors that had just come through the gums. In reply to my inquiries she could not remember that the child had had an illness of any kind. The boy had always been healthy and had escaped all of the infantile diseases. Being convinced that something had occurred that would have been noted, I asked her if the child had had any kind of an injury. This quickly brought out the statement that the child had had a severe burn, a scald, on the side and back, that had healed slowly after much suppuration. Indeed, the child had been very ill with septicemia for a month or six weeks. The time corresponded with the marks upon the teeth.

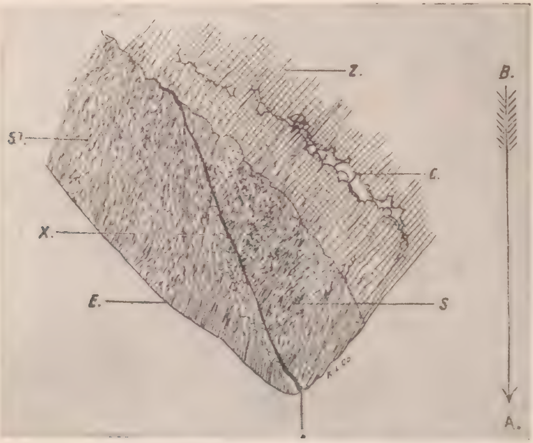


Fig. 16. Lengthwise section through portion of crown of an atrophied tooth. (a) Direction toward the crown. (b) Direction toward the root. (z) Dentin. (c) Interglobular spaces. (e) Enamel. (s) Wedge-shaped piece separated by line of injury. (i and x) Line of injury. (s) Full thickness of enamel. Zsigmundy.

Cases like these, but every one different in detail, could be multiplied almost indefinitely. Scarlet fever, measles and whooping-cough come in for a large share in producing these marks. My observations for some time led me to believe that scarlet fever and measles are most often to blame for the rows of fine pits, but of late I have found so many of these following other forms of disease that I am led to doubt the distinguishing features of these marks. Certainly, hereditary syphilis comes in for its full share of these cases.

On the other hand we can not say, at least I can not, that marked teeth will result from this or that illness. If the hair falls out or the finger nails show a groove after an illness we are apt to find the teeth marked also. Very many of the cases that I have noted and watched for the coming of the permanent teeth have presented me with teeth without a blemish. Indeed, among all of the cases that I have noted and watched, the marked teeth have been the exception rather than the rule. Still, it remains true that when I have been able to obtain a satisfactory history the marked teeth have coincided in time with some form of disease that might well have interfered seriously with the nutritive processes. This history is not always easy to get, even among intelligent people. I once remarked to a lady in my chair that she had been very sick with scarlet fever when she was about two years old. She was very sure she had not, for she had never been told of such an occurrence. When I explained that accu-

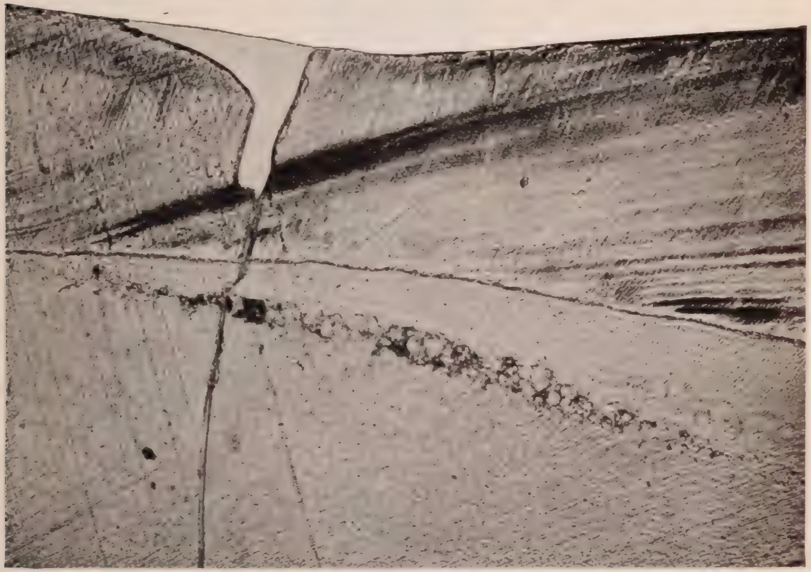


Fig. 17. Section from labial portion of a central incisor, showing a milder sort of injury from atrophy in which the growth of the enamel was interrupted but not permanently stopped. The line of interglobular spaces literally divides the dentin of first formation from that of the second. The section was broken and the parts placed in position. A scrap of enamel was lost, as represented by the dotted line. (See Figs. 18 and 19.)

rate knowledge of the facts was of considerable scientific value she said she would question her mother regarding it. The next day I received a note saying her mother's story agreed with my supposition, both as to the particular disease and the date of the illness. I have seen many of these cases, however, in which I could find no history of the illness causing them.

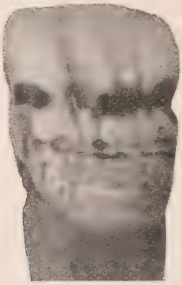


Fig. 18. Labial surface of central incisor from which the section was cut, a part of which is shown in Fig. 17, photographed to show the appearance of the groove. The dark color in parts of the groove make it appear deeper than it really is. (See Fig. 19.)

As an assistance in searching for the cause that has led to atrophy in cases coming before us, I introduce a diagramatic chart, or index, indicating by lines across the incisors and cuspids the positions the grooves across the teeth assume because of disease occurring at different ages of the child (Fig. 9). I have varied these lines a little from the true contemporaneous calcification lines to suit better the apparent positions upon teeth that are shortened by severe atrophy. This chart will point out the age at which any injury occurred as

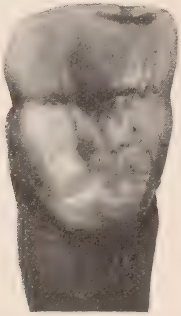


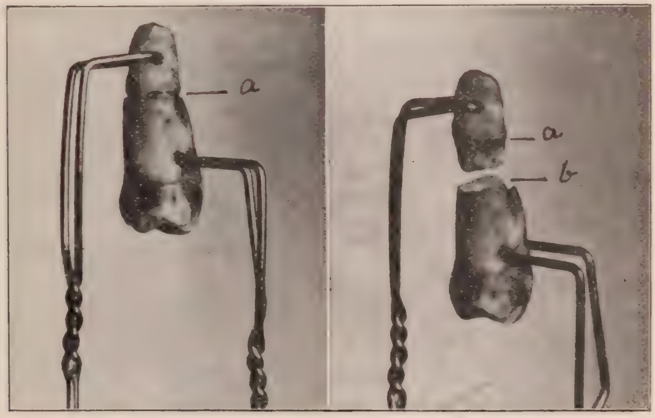
Fig. 19. Photograph of the lingual surface of the same tooth shown in Fig. 18.

well, perhaps, as it can be done in a chart of this character, which, of course, is founded upon averages. Pretty wide variations will occur in the time of the calcification of the teeth of the individual, and also between the several teeth of the same individual. There is certainly as much variation as eighteen months in the time of the beginning if the calcification of the central incisors, and a greater range possibly with all of the other teeth, except the first molars. These latter are perhaps the most constant. But these certainly vary from the twenty-fifth week of uterine life to something near six months after birth.

The chart is intended only to give a general average as to the time of the illness that has caused these injuries.

HISTOLOGICAL CHARACTERS IN ATROPHY OF THE TEETH.

In presenting the histological characteristics in atrophy of the teeth, it may be stated that all of the cases thus far examined by myself, no matter how different their outward appearance, present one plan of departure from the normal arrangement of tissues. The differences are only due to position, the number of zones of injury and in the details of severity. This plan is inseparably linked with



Root of tooth parted on lines of growth. Photographed by Dr. F. B. Noyes from the specimen now in the Museum of Northwestern University Dental School.

Figs. 20-21. Photographs of a bicuspid tooth which had a zone of injury from atrophy mid-length of the root, and which was pulled apart in telescope form along the line of injury, i. e., the line of interglobular spaces. In Fig. 20 the parts are photographed in normal position. In Fig. 21, the two parts are separated, showing how they are telescoped together.

the plan of development of the dental tissues. There are, however, other forms of deformity of the enamel in a degree simulating atrophy, but which are entirely different in histological characters. Some of these will be noted later.

Except in the pits that often accompany it, the zones of injury in atrophy rigidly follow the lines of Ritzeus. In the diagram (Fig. 10) the lines of Ritzeus are made especially prominent to recall distinctly their direction on different parts of the enamel cap of the crown of the tooth. In microscopic observation these are usually clearly seen in some parts of the enamel cap, particularly in central labio-lingual sections. They vary, however, indefinitely in prominence in different sections, and in different parts of the same section. Generally, they do not show clearly in all parts of a section, and those who have not studied them carefully should refresh their memory as to their course in different positions on the crown of the tooth. These lines are the index to the growth of the enamel cap. They are the real lines of accretion and show distinctly the order in which the enamel cap is built up, layer after layer, in its growth. This growth begins at the cutting edge (or points of the cusps in molars and bicuspids) on the dento-enamel junction and grows from within outward, while the dentine begins its growth at the same point and progresses from without inward. The growth of dentine is always a little in advance of the enamel as it grows from the incisal edge of the front teeth (or the points of the cusps of other teeth) toward the gingival line.

Atrophy, in all cases, consists of an arrest, or partial arrest, of growth of both enamel and dentine in the particular zone or part of enamel and dentine, being developed at the particular time. In the milder cases growth is imperfect, leaving certain definite markings outlining the particular parts of the tissue then being formed. In all the severe cases the growth of both enamel and dentine is arrested. There seems to be no recovery of the part of the enamel organ that was at the time in active function. No more enamel whatever is formed over the area affected after recovery from the condition of mal-nutrition, except as the new formation is telescoped over the area of the old. The dentine pulp, however, rebegins its growth function apparently immediately the condition of mal-nutrition has passed. But the parts of the tooth which should have been formed during that period are not formed at all. A certain part of the tissue which should have constituted the perfect tooth has been left out, and the distortion of form which we so often see results from patching the second growth onto the first and the total failure of particular portions of the enamel. This total failure of the enamel is not in the direction of the thickness, but is always on the lines of Ritzeus. Therefore, as we shall see later, there is never a failure of the total thickness of the enamel at any point, except in a few cases in which the injury occurs at a time when calcification was just about to begin, as sometimes occurs in the so-called Hutchinson tooth, and may,

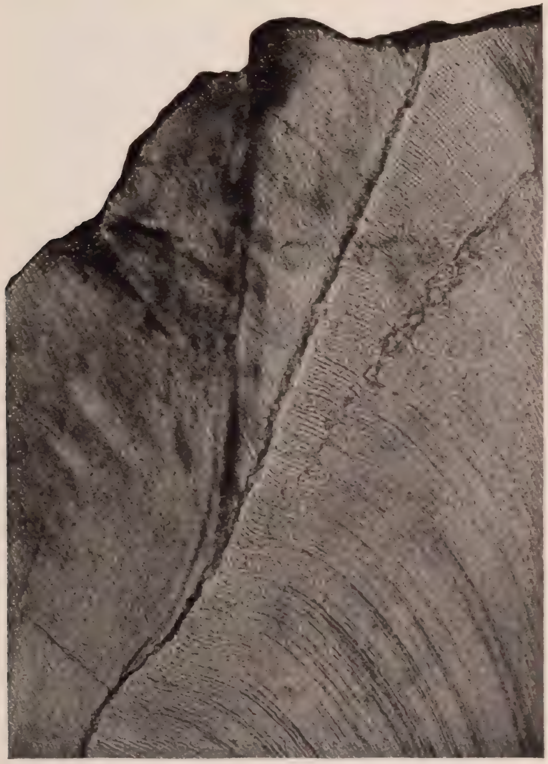


Fig. 22. Section through a central incisor, showing atrophy of the severer sort. The plan of the injury, and the telescoping together of the parts, is seen to be the same as in Figs. 13 and 14, but the discoloration is much less. The thin incisal edge had been ground away before extraction in an effort to improve the appearance.

rarely, occur in others. For instance, in the diagram (Fig. 9) there are four layers of enamel represented over the incisal edge. If total arrest of growth should occur at the time the two first layers are completed, the third and fourth layers will never be formed. The enamel will remain over the incisal edge with only these two layers. Then perhaps the fifth and sixth layers shown, more or less, will also fail, and the seventh and eighth layers will overlap the first and second somewhere near half their length, because the formed part of the incisal edge sinks into the dentine pulp. The dentine pulp has also stopped its growth at the same time and that part that failed of growth is left out of the final tooth form. These are the fundamental propositions presented in the explanation of the histological groupings of tissue and the shortening of the tooth crown found in these cases.

In Figs. 11 and 12 I present micro-photographs, made with a very low power, of labio-lingual sections from two atrophied teeth so that the entire form of the crown of each may be seen. The one presents two zones of injury, while the other has but one. In each of these the mal-nutrition was so severe as to arrest the growth of both enamel and dentine. In each an injury has occurred, affecting the incisal edge of the tooth. By comparing these with the diagram it is easily seen that when a certain thickness of growth of enamel had formed over this part, development was arrested and no more enamel was formed. In each case the enamel is thickest at the incisal edge and thins away to the groove which encircles the tooth crown, which is here presented in section. A band of very dark growth is seen under the new after-growth of enamel following the lines of Ritzeus on down to the dento-enamel junction. A comparison now with the diagram shows that the growth has been arrested on the lines of accretion or lines of Ritzeus, as you may please to call these lines (Fig. 10) in both cases. Also, it is seen that the second injury in Fig. 9 is similar in plan to the first, differing in detail only because of the changed direction of the lines of accretion. In Fig. 11 the incisal edge is broken, as usually occurs in these thin edges, but Fig. 12 is from a tooth extracted soon after it came through the gums and all of the tissue formed is present.

Figure 13 is an illustration with a much higher power of the labial side of the first zone of injury shown in Fig. 11. Fig. 14 is from the second zone of injury on the labial side, and Fig. 15 is from the second zone of injury on the lingual side. In these the tissues and the lines of Ritzeus are fairly well shown, and by studying the micro-photographs carefully, the relations of the tissues formed before and after the injury may be made out. It will be noted in Fig. 13 that the one particularly dark band which represents the surface of the enamel formed over the incisal edge, is continued under the enamel of second formation to the dento-enamel junction. Beginning a little farther from the incisal, a line of inter-globular spaces appears in the dentine, and running almost parallel with the dento-enamel junction, continues on toward the incisal edge. Faint

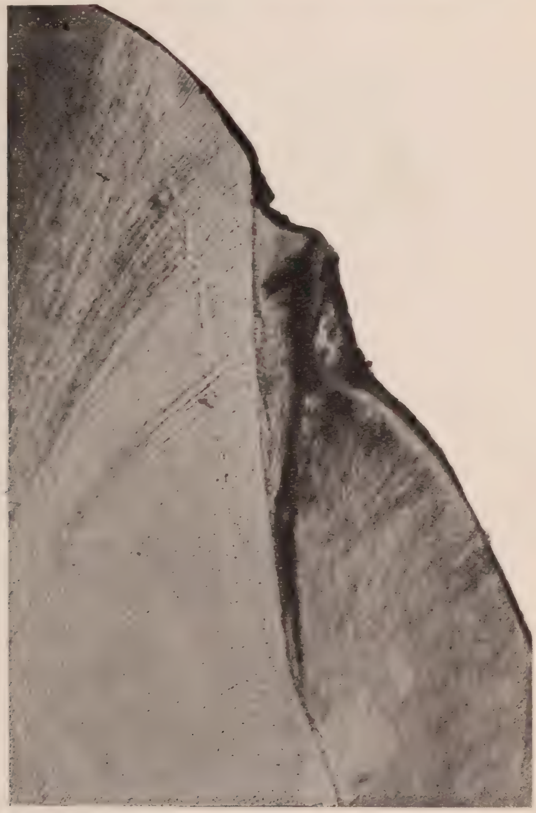


Fig 23. Portion of a section from an incisor showing zone of atrophy and the plan upon which the parts are telescoped together. The thin incisal edge had been ground away before extraction.

traces of these appear even in the small picture (Fig. 12). With sufficient amplification, this line of interglobular spaces is found to continue to the incisal edge and join with the similar line from the opposite or lingual side; that is, in the whole tooth it is a sheet or zone of interglobular spaces passing throughout the full extent of the dentine, of which this is a section. This line represents the injury in the dentine. It also represents more. It marks the boundaries of the old and the new formation of dentine and is the line on which these have been patched together. On the other hand, the one dark line in the enamel marks the line on which the new formation of enamel is patched onto the old. After a very careful study of sections from many of these teeth, I am fully of the opinion that that part of the tooth which should have formed during the stoppage of growth was not formed at all. The enamel organ was destroyed through its whole thickness to the point where the dark line limiting the first enamel formation reaches the dento-enamel junction, and when the second formation began it was telescoped over the old and laid down upon it, as shown in the illustration. The crown of the tooth was shortened that much, certainly, and may have been shortened very much more. When we study carefully Fig. 12, with its single line of injury, and note how the little part of the incisal edge formed before the injury is literally sunken into that portion formed later, we must conclude that the shortening is much greater than that shown by the apparent telescoping of the parts. In the dentine the same thing occurs, only that it is expressed differently because of the different character of the tissue. The line of interglobular spaces shows where the second growth was telescoped *into* the first.

A study of Figs. 13 and 14 shows the same plan in the arrangement of the tissue in the second zone of injury, including the overlapping of the new enamel onto the old and the accompanying line of interglobular spaces in the dentine. The shorter overlapping of the enamel at the point of injury is due to the changed direction of the lines of growth. The actual shortening of the tooth may have been much greater. When we study the short and stumpy forms of many of the crowns of these atrophied teeth, we must conclude that the shortening is often very much greater than this overlapping. It is this shortening and telescoping together of the different parts that is responsible for the greater part of the distortion of form so often observed in these teeth. It appears certain that the tendency is to form each of the parts on the lines that each would have had at the specified time of growth if there had been no interruption of the growth.

We may gain another view of this by studying the lines of the labial dento-enamel junction. In the study of sections of many human incisor and cuspid teeth, this line is found to form a continuous curve from the incisal edge to the gingival line, as seen in the diagram (Fig. 10). The amount of curve may vary indefinitely, but it is always a continuous curve in every normal tooth. In studying sections of atrophied teeth, this curve is found broken by a recurve at the zone of injury in every case, even in the lighter forms in which growth seems not to have been completely arrested. This disturbance of the direction of this line seems to be due to the effort to form the second part on the lines that would have been laid down at that time if the growth had been going regularly, and the larger and smaller are patched together. In the dentine the growth has

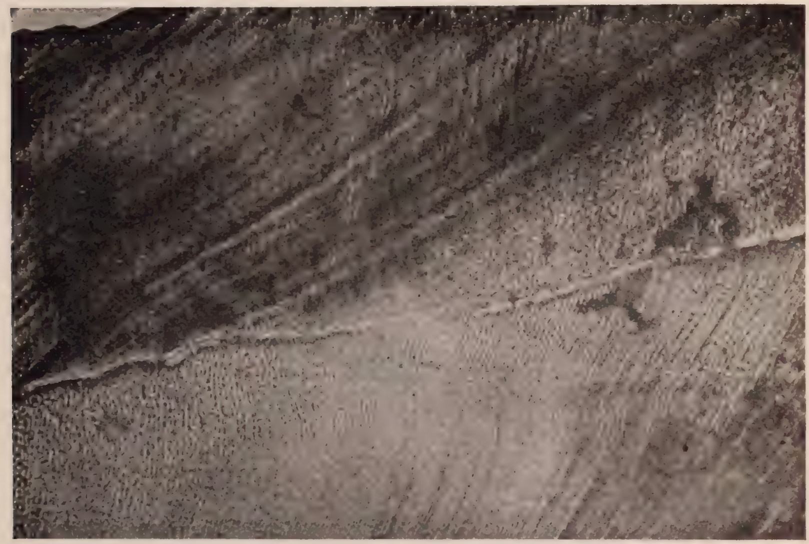


Fig. 24. Microphotograph from labial portion of a section from an incisor tooth that showed but faint traces of an atrophy mark on the surface of the enamel. The markings in both the enamel and dentin are such as are found in the milder forms of atrophy.

been in abeyance and the growth begins on the lines on which it was left off. But immediately the tendency is to enlarge to the greater outline of the tooth as it would have been at the time had the growth not been interrupted. This causes a recurve in the line of the dento-enamel junction. In the enamel, the telescoping seems to be actual. That part of the enamel organ that had not arrived at the period of enamel building is uninjured and is pushed forward over the previously formed enamel and lays down its layers of the second growth of enamel thus far over the old. I can see no other explanation of the phenomena presented after the study of numerous cases.

The discoloration that occurs in these teeth would seem to be an essential characteristic, if it were judged entirely by the teeth obtained for making sections. This material is very difficult to find. Only extracted teeth can be used, of course, and few of them are extracted until so badly decayed that they are useless, except those that are so badly discolored that patients and their friends urge their removal on that account. Examinations in the mouth reveal many cases of very considerable deformity without notable discoloration, as the photograph (Fig. 8), taken from the mouth, attests. Many of the zones of injury show no discoloration.

Many writers have given short descriptions of atrophied teeth, scattering back for a hundred years. Most of these have dealt with the outward appearance only. Very few have published any studies of the histological characters, and most of these have been very brief and imperfect. Among the better should be mentioned Wedl, 1870; Baume, 1882; Walkoff, 1885. But by far the most important of the studies that have appeared is that by Dr. Otto Zsigmondy of Vienna, Austria, a paper presented at the World's Columbian Dental Congress in Chicago in 1893. Unfortunately for Americans, no translation into English has been published. I personally examined many of Dr. Zsigmondy's sections and learned further of his conclusions in conversation. The one thing that impressed me then, and impresses me now, as I reread his paper, is his conviction that the tissue distortion has been produced by a condition that has been of very short duration, because the apparent zones of injury in the dentine were often—nearly always, indeed—so very narrow when considered in their relation to the developmental lines. He could not, therefore, account for the marked deformity of these teeth. At the time he wrote he did not have the advantage of micro-photographic reproductions and his illustrations were very meager and insufficient. I reproduce one of the best of them (Fig. 16).

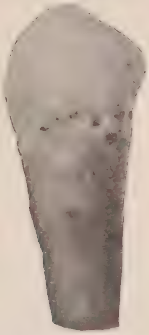


Fig. 25. Photograph of a bicuspid, showing imperfectly a slight groove from atrophy near the junction of the middle and gingival third of the crown. (See Figs. 26 and 27.)

In Fig. 17 I present a micro-photograph of a section of the labial portion of a zone of injury of the milder sort apparently, occurring in a central incisor. In this there was considerable discoloration of the enamel occurring irregularly along the line of injury in the labial surface, as shown in the photograph of the tooth (Figs. 18 and 19).

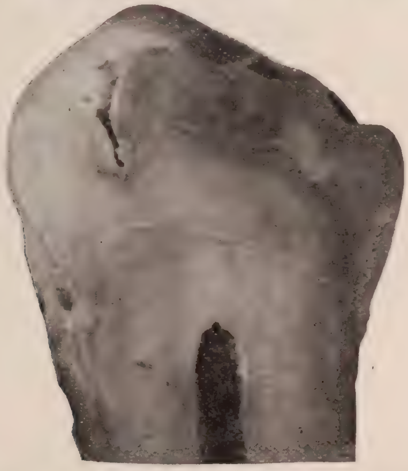


Fig. 26. The bicuspid shown in Fig. 24 split mesiodistally and the cut surface photographed as an opaque object. Note a broad zone of shadow in the dentin, extending in a semi-circular form from the groove on the mesial to the groove on the distal side. (See also Fig. 28.)

The discoloration in the line of the groove in the photograph has the effect of a shadow and makes the groove appear deeper in the discolored portions, which is not the fact. The particular section from which Fig. 17 was made was chosen from a part showing the least discoloration. In this case the only distortion of the crown apparent in a superficial view of the tooth is the groove encircling the tooth and the discoloration. Also, the section shows that there was not a complete arrest of growth of the enamel. With a good light the enamel rods may be traced with the microscope through the darkest lines of the section, and they are seen to be well formed. There is no appearance of the telescoping process. The groove in the enamel appears much less pronounced in the section when highly magnified as shown, than it does in the photographs of the tooth. In the dentine, however, the injury is very severe, as shown by the clean-cut continuous line of interglobular spaces, which literally cut the dentine first formed from that formed later, and in the examination of the labial line of the dento-enamel junction in the full section, it is found to be distorted by a recurve, showing the interference with growth to have been profound and that some real shortening of the tooth must have occurred.

As a further illustration of the possibilities in this class of injuries, I present two photographs (Figs. 20 and 21) of a bicuspid tooth showing the separation of the telescoped parts in an injury of this kind occurring midlength of the root.

I extracted this tooth myself. The patient, a stranger to me, applied for relief from caries of the upper jaw, and this tooth was situated on the border of the carious area in such position, that in my judgment it was best to remove it, though the tooth and its individual alveolar process were otherwise in good condition. At the moment of removing it I noticed that the apical portion of the root did not come away, but was pulled from its place and remained loose in the alveolus. Laying the tooth on the bracket with the forceps, I quickly picked out this apical portion with the foil pliers and laid it with the tooth for after examination because it struck me at the time as a very curious break. I then completed the operation in hand and dismissed my patient with an engagement to return later for further treatment. On examination of this tooth and root I found it had pulled apart like a telescope tube and that this telescoping was on the lines of growth of the dentine. Fig. 20 shows the tooth and root placed together in the normal form in which *a* marks the line break. In Fig. 21 the two parts are separated, showing how the apical portion telescopes into the body of the root. I suppose there was some severe form of illness of short duration at the time this part of the root was developing, which prevented the deposit of lime salts, and a sharp, distinct and continuous line of interglobular spaces occurred. At the time the root was developed only as far as shown in the lower section of Fig. 21 and had the broad conical opening shown at *b*. The internal diameter at the point to which the end of the apical portion reaches was of the size shown by the end of that piece. The result was that the solid dentine formed represented only the lower square end of the upper piece. This was broken in the effort to extract and the root pulled apart on the line of the area of interglobular spaces, the line representing the lines of the process of growth.

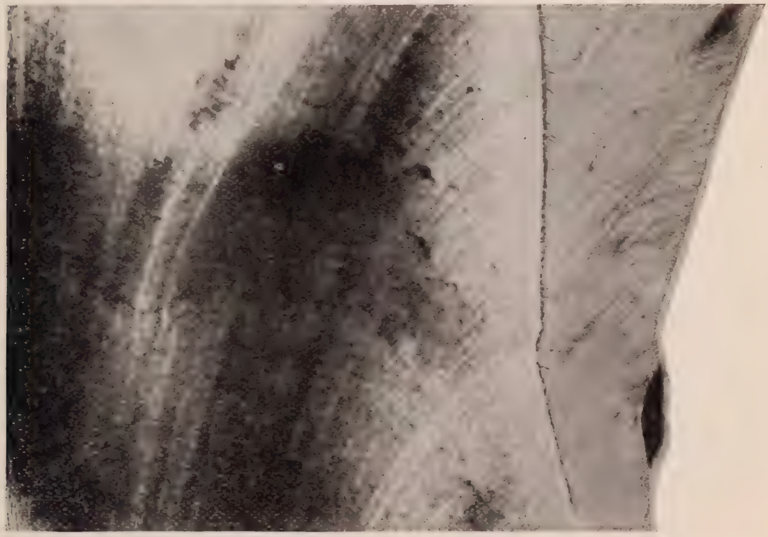


Fig. 27. Microphotograph from a section of bicuspid shown in Figs. 25 and 26, showing zone of shadow in the dentin as a result of interference with nutrition. Markings of this character are found in the mildest forms of interference with nutrition that show atrophy marks.

The patient failed to return to his engagement for further treatment, and I never saw him again. I therefore lost the opportunity to inquire into the nature of the nutritional disturbance that had caused this rare form of injury. The specimen, however, tells its own story clearly. This case shows that the root of a tooth may also be injured by atrophy, though such an extreme occurrence as this must be rare.

I have noted a considerable number of cases in which a zone of injury occurred in the dentine beginning below the gingival line, as in the case shown in Figs. 20 and 21, though they are far more rare than those occurring in the crown of the tooth. In Fig. 11 there is such a zone of injury which may be seen even in that slight amplification in the disturbance of the outlines of the root and some faint shadows representing the lines of interglobular spaces. With medium powers of the microscope, these latter are prominent objects.

In Fig. 22 I present another case of atrophy of the graver sort, occurring in a central incisor, in which but little discoloration is apparent. The wide overlapping of the new onto the older enamel, the complete breakage of the enamel rods along the line of junction of the two, the change in the course of the enamel rods in the two formations of enamel and the profound disturbance of and recurving of the labial dento-enamel junction, all point to a long suspension of nutrition and accounts for the grave distortion of the form of the tooth. This is much like that shown in Fig. 12. The line of interglobular spaces is sharp and severe, but very narrow, and the dentine is normal immediately on either side. The incisal edge had been ground away in the endeavor to improve the appearance before the tooth, with the other incisors, was extracted. About one-third of the normal length of the crown had been missing.

In Fig. 23 I present another similar case, but with rather more discoloration. The incisal edge of this had also been ground away in the effort to improve the appearance before resorting to extraction. In this the main features are again repeated. The same line of demarkation between the old and new enamel, the same distortion by recurve of the labial dento-enamel junction and the same sharp line of interglobular spaces. In this particular case the character of the line of interglobular spaces is almost obscured by being filled with balsam in mounting the section.

In Fig. 24 I present a case that was apparently of the mildest description. The only outward appearance was a band of slightly dark color across the labial surface of the tooth. One not searching for cases of this character might have passed the tooth as normal. The tissue reveals a pronounced disturbance in the same particulars as in the more severe cases, only not so grave. The enamel rods pass through all of the darkened lines without a break, and there are almost no interglobular spaces in the dentine. A sharp curve and recurve in the dentinal tubules give the appearance of a very distinct line of injury, however. The line of the labial dento-enamel junction is also considerably disturbed.

The next case is very curious in several respects. It is a bicuspid tooth that showed a very slight groove in the enamel not far from the gingival line. It was covered by the overlapping gum margin, except on the buccal surface. The whole tooth was, perhaps, as white as any normal tooth and was without any discoloration along the line of the groove, except that caused by a deposit of dark, closely adherent serumal calculus at several points. I tried to photograph this groove with but partial success, as is shown in Fig. 25. I then divided the tooth mesio-distally, preparatory to grinding sections. In examining the halves with the pocket lens, I discovered a curious zone of injury in the dentine, which I photographed at once as an opaque object,

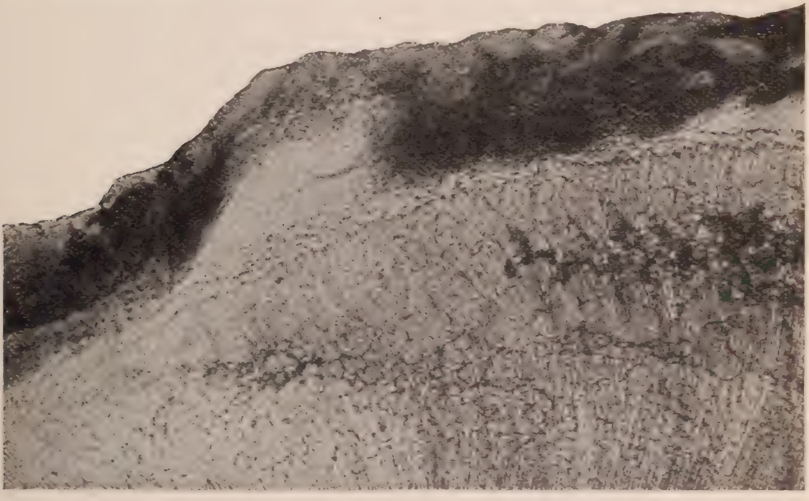


Fig. 28. Microphotograph from section of atrophied tooth cut diagonally to the zone of injury and serving to exaggerate the width of the zone of interglobular spaces in the dentin. This gives a stronger representation of the real injury to the dentin.

which is represented in Fig. 26. I then ground two sections 2/1000 of an inch thick and mounted without removing them from the cover glass on which they were ground. The sections were beautiful. No one would suspect that there was any zone of injury in either dentine or enamel. The disturbance of the line of the dento-enamel junction and in the one section a clinging bit of serumal calculus were the only abnormalities discoverable by microscopic examination. The only way I could explain this was that the something that had been seen and photographed had been obscured by the balsam. I removed the sections, dissolved out the balsam and dried them. Then I found a zone of fine interglobular spaces with another singular appearance in the form of a broad line of demarkation that I can not explain. I remounted in a very stiff balsam without using anything to clear the dentine, excepting to make a photo-micrograph that evening. Something prevented, and by the next evening, the day having been unusually warm, the interglobular spaces were again filled with balsam. The shadow, however, remained, and is presented in Fig. 27. I have, since cutting this specimen, found that the condition presented is common to a considerable number of the slighter atrophic injuries.

In Fig. 28 I give a photo-micrograph of a labio-lingual section cut from near the mesial side of an atrophied tooth so that the line of interglobular spaces is cut through diagonally. This gives an exaggerated view of the zone of injury to the dentine, but will serve to impress the fact that these injuries are very severe.

This, to my mind, presents this subject from its gravest to its slightest degree, as I have seen it, in sufficient variety of cases to render the conditions intelligible.

(To be continued.)

A FEATURE OF PYORRHEA TREATMENT.*

BY W. V.-B. AMES, CHICAGO, ILL.

However much our opinions may differ as to the causation and modifying influences of the disorder we have come to call pyorrhea alveolaris, we are happily almost concerted as to the value of many methods of treatment. Any dissertation on the management of this lesion will be found prefaced by the inference that it is a foregone conclusion that the surgical removal of foreign accretions is the matter of primary importance, and that ultimate good results depend upon the thoroughness with which this is accomplished. So, also, in any desperately bad case, presenting teeth seriously loose in their sockets, the importance of surgical rest is uniformly recognized, this being secured by proper adjustment of the occlusion and by the construction of sufficiently rigid splints. Apropos of this reference to splints, I will venture that the dental practice of the more or less near future will recognize extensive fixed bridging as a means of securing for a patient, for a gratifying period, the services of a natural denture, which the ravages of pyorrhea alveolaris today almost universally condemns to the forceps.

A feature of the treatment of pyorrhea, which it is my main purpose to present today, it seems ought to be as universally accepted as being logical and practicable as the removal of accretions, the adjustment of the occlusion, or the giving to loose teeth surgical rest. This feature of treatment I will announce in a general way to be *"continued mild medication."* This medication may be the presenting of a condition which will give to the tissues continued mild stimulation, a continued mild astringent effect, or possibly in some stages a continued mild sedative effect; probably in all cases a continued mild sterilizing effect being called for.

The suggestion to me of what I offer which may savor of innovation has come from clinical observation of persons, some of whom I can not mention by name, after the placing of bland and inoffensive material upon the roots of teeth, which in time must be acted upon by the fluids of the environment to produce a trace of a potent medicinal agent, affording a continued mild medication.

---

*Read before the Odontological Society of Chicago.

Examples easily mentioned, which probably have suggested to me a line of medication which has proven efficacious, are, the placing of silver bands about the roots of teeth to furnish silver salts for their typical effect, the credit of which I can not place, and the method suggested by Dr. E. R. Carpenter before this Society of filling the spaces at the bifurcation of multirooted teeth with oxyphosphate of copper, when a space exists at that location from recession of tissues, getting in this instance a "continued mild medication" reasonably expected from the mass of this material in such an environment.

In observing such results, the query has presented: How can such effects be secured to an extent in a simple and easy manner about and within the pockets that a pyorrhea case presents?

As an example of simple continued medication, we have the employment of so-called milk of magnesia, which is theoretically and probably in reality an antacid of considerable value. Let us suppose that occasion calls for a continued antacid effect within a pyorrhea pocket, and suppose that a paste of magnesium hydrate, the sediment of milk of magnesia, were available, which could be readily introduced to the extreme depth of this pyorrhea pocket. Is it not reasonable to believe that some of this paste would remain in position for several days and an antacid state be maintained until the last trace has been removed by chemical action or otherwise?

Suppose, further, that a continued zinc salt effect be desired within such pocket. The zinc salt effect is astringent and to stimulate healthy granulations. Zinc hydrate, of itself a bland material, may be made into a paste and carried to the extreme depth of a pocket to exercise its typical action for a prolonged period because of the formation of soluble zinc salts by the action of acids developed *in situ*, to say nothing of the effect of the hydrate *per se* from continuous contact. Zinc hydrate seems the material *par excellence* for the position, because of its potency and unobjectionable color. Ferric hydrate might be as efficacious, but carries an objectionable color. A combination of magnesium and zinc hydrate might quite naturally suggest itself. These pastes would ordinarily be made with glycerine or glycerine and gelatin combined, and may be made to contain such sterilizing agents as are supposed to be valuable additions to tooth pastes and mouth washes. These pastes may be used by the patient in the sanitation of the mouth with reasonable anticipation of decided benefit from the lodgment of the hydrates beneath the gum margin and between the teeth. Such pastes may be introduced by the dentist by being placed beneath the gum margin and being carried farther by a massaging process. A cement syringe, such as that manufactured by Dr. Siqueland, of St. Paul, would introduce the paste well into the depths of the pocket, especially if the point of the ejector tube be flattened.

If a zinc hydrate paste be used at bedtime, there will be no evidence, from taste, of a zinc compound, but on wakening, hours after, the presence in the mouth of zinc salts is unmistakable. This may bring up the possibility of zinc poisoning, which, while not a persistently serious affliction, is a possibility worth consideration. Clinical data indicate that there need be little danger of untoward results if the zinc compound entered the stomach with or soon after a meal. In counting on the continued medication, there must be the possibility of traces of zinc salts entering the empty stomach with the saliva. In watching a few cases experimented upon I have not been able to detect annoying symptoms such as could be attributed to zinc salts or hydrate entering the alimentary canal. With exercising care to remove the paste from the papillose surface of the tongue by brushing or scraping, I feel that there need be little fear of zinc poisoning of even a susceptible subject. A serious mouth malady might even justify a possible temporary intestinal derangement.

In addition I have only to say that if I were in dental practice at present, I would rely upon this method of medication in all cases exhibiting pyorrhea or a pyorrheal tendency. I have not given any definite formulae, as the paste should be simply one of glycerine or glycerine and gelatine, loaded up with the hydrate and containing essential oils, etc., to suit your individual preferences. The zinc hydrate is easily obtained by precipitation by aqua ammonia of such a zinc salt as the sulphate.

GOLD FILLING.*

BY DR. A. J. ELMER, BLOOMINGTON, ILL.

It is not the purpose of this paper to engage in any discussion upon the classification of cavities where filling with gold is indicated. It is more its aim to demonstrate the superiority of gold filling as a tooth preservative over other materials used for the same purpose. The qualifications necessary in a perfect filling material may be classified as follows:

First, adaptability to the walls of the cavity; second, edge strength; third, resistance to crushing strain; fourth, insolubility; fifth, permanence of size and form after insertion; sixth, color.

Permanence of the operation depends upon the first five, and it is the notion of the essayist that gold approaches nearer to perfection in these five requirements than any of the other materials we use.

In securing adaptability to the walls we have long been told that gold as ordinarily manipulated falls far short of our requirements in this particular. Still the fact remains to us that we have seen gold fillings preserving tooth structure after four decades.

Gold unannealed, or but partially annealed, can with proper manipulation be brought into such close contact with the walls and edges of a cavity as to practically hermetically seal it, thereby insuring it against the further inroads of decay. To secure results approaching perfection in this particular it is the writer's idea that the cavity should be so formed as to give the operator as nearly direct access to the various cavity walls as it is possible to secure. In other words, it is extremely difficult to adapt and condense gold by working "around a corner." The same rule applies to obtaining condensation at the edges—pressure being applied as nearly as possible at right angles to the edge to be covered.

Another point in this connection is the fastening of your filling from the start, for a filling that rocks, however early in the process of insertion, can never be adapted to the walls.

---

*Read before the Northern Illinois Dental Society, at Elgin, October, 1905.

As to edge strength, it is the writer's conviction that gold comes as near perfection in this particular as any of the filling materials. After the enamel rods have been properly beveled at the cavo-surface angle, an edge of gold can be so condensed over them as not only to practically exclude the oral fluids and agents of decay, but to resist the pressure of mastication for a long time. No other filling material possesses the edge strength that enables us to bevel this angle at all.

In the use of gold as a restorative of contour, especially in the cutting edges of the incisors, this advantage is most satisfactorily demonstrated.

In density, or resistance to crushing strain, it is the belief of the adherents of gold as a filling material, that no other material approaches this one. Gold fillings have been condensed under hand pressure alone to a specific gravity of 18-47/100, which is not far short of the specific gravity of forged mint bar. Can there be any question of its density, or as to whether or not it will resist the pressure of mastication?

Gold fillings we have also that after subjection to the rolling process, whereby they have been rolled as thin as was possible with the rollers at hand, have come out in a single piece. Is this any proof of their density, or of the welding capacity of the gold? How many fillings do we see that have fractured from the pressure of mastication to which they have been subjected, and what percentage of them are gold fillings?

With the question of insolubility, gold as a filling material has nothing whatever to do. This of course applies to gold fillings that are anchored by mechanical means, such as the formation of the cavity. To fillings of any material depending for their retention upon the adhesive quality of a cement, where such cement comes to the cavity edge, the old law of the strength of a chain and its weakest link, still applies.

There are those of us who advocate cement as a retentive, but even they are careful in trimming away all cement in such a manner as to prevent its reaching the edge. Upon the use of cement in this manner the writer will make no comment.

Fillings of another material are, however, used in such a way as to necessitate a film of cement, however thin, reaching the edge in its entire periphery. Will it dissolve, and if it does, will caries recur in that dentine, or can the same filling be replaced with safety?

If a filling that is fitted to a cavity within 1/1000 of an inch is then set in that cavity in a cement whose granules measure 7/1000 of an inch, what becomes of the other 6/1000? Must we trim it off flush with the enamel surface, and if the cavity surface of this filling approaches the enamel surface at an angle greater than 90 degrees (which most of them do) how wide an interval does this 7/1000 of an inch become between the enamel and the filling proper? In other words, how much of a surface does your cement present to the action of those fluids which are destined to dissolve it?

Upon the fifth requirement in this classification, "permanence of size and form," little need be said in this connection, as gold, once condensed, neither contracts nor expands. This has long been the chief objection to the plastics, as the process of crystallization, either of a mixture or an amalgam, is generally accompanied by contraction or expansion, toward or away from a center, as the case may be, which center is usually coincident with the center of gravity. This necessitates a change of form as well as of size.

In the matter of color, we who champion the cause of the gold filling have met a foeman more than worthy of our steel, and yet, too, we have seen fillings of other materials made for the purpose of approaching the color of the tooth structure, which have fallen as far short of that color as a gold filling would be. This, of course, has not been entirely the fault of the filling material. The question, however, as it appeals to us, has resolved itself into this—shall we choose as a filling material that which most nearly approaches perfection in most of the points required? This we think we have done in the choice of gold.

Is it possible that as a profession our line of progress is taking the form of a circle? Are we coming back for a filling material to that which has proved itself of value and permanence through generations?

On one occasion the writer asked of one of the few men who stand pre-eminent among us as experts in gold filling, what he thought of the relative permanence of gold and other materials? His answer, somewhat ambiguous, was this:

"Some of our patients prefer being temporarily beautiful to what they call 'permanently ugly'." The following year this same gentleman read a paper on gold filling before the State Society at Peoria, and it was given rapt attention. His clinic at the same meeting and on the same subject was so crowded that it was possible for only a few to get near enough to see him. This must mean that gold is again in the ascendency.

It will be noticed that this paper has rather encouraged discussion than otherwise. Questions have been asked with that end in view. Men pre-eminent for their mental and professional attainments have taken so decided a stand under the banners of the various filling materials, that when a man consents to read a paper on "Gold Filling" before a dental society, he knows what to expect at the hands of his colleagues. We do expect it. To say we are ready for it, however, carries the meaning of a friendly discussion rather than that of a pernicious rivalry.

With the classification and formation of cavities—with the indication, or contra-indication of gold, or any other particular filling material—with the various forms of gold as it is used, whether of foils, cylinders, mats, or fiber, and with the various methods of manipulation which such a variety of forms necessitates, this paper has had nothing whatever to do. Those are questions decided in individual cases, and by individual operators. But it is with the generality of cases, where the restoration of tooth structure is called for, and where we are called upon to choose that filling material which most nearly fills all the requirements of perfection, that this paper has had to deal.

In conclusion it is only necessary to say that, presupposing the facts that the cavity is properly prepared, the filling well started on a solid base, our best endeavors given toward securing adaptation, sufficient pressure used to insure the proper degree of condensation, care being exercised in covering the edges, correct contour and consequent contact point if the filling be approximate, and last, but by no means least, a smooth, even surface, continuous with that of the enamel and brought to a mirror-like polish, we believe gold to be a better preservative of tooth structure, in a larger majority of cases, than any other filling material at our disposal. Let us not lay failure in these operations to a faulty material, but rather to methods of practice, or mal-practice, among that horde of careless operators whose chief aim, in an operation requiring such an extreme of care as the insertion of a gold filling, seems to be to "get through."

Let us not be misunderstood as saying that the other materials in common use for fillings have no place. They have—a big one—and they fill it well. It is, however, the writer's conviction that from the standpoint of permanence, gold is still the king.

GOLD INLAYS.*

BY W. G. CLARK, D. D. S., CHICAGO, ILL.

Among the numerous devices that have been brought before the dental profession in recent years, the gold inlay has taken a prominent place, and I am satisfied it has come to stay. It is not intended to entirely supplant any of the old and tried methods of restoration, but to add to our list and enlarge our scope of usefulness.

In former years gold, used as a filling material, was the mainstay of the dentists of that day. There were men who clung to it through long years of successful practice and would use nothing else, some taking the extreme position that teeth that could not be filled with gold were not worth saving.

About the middle of the last century, a movement known as the new departure was started by some skillful and talented men who claimed that teeth could be better conserved by the use of plastic fillings.

Within recent years porcelain restoration has taken a prominent place in our literature and daily practice. Some men have become so expert that they use it under almost all conditions. The average dentist, however, is more conservative and adapts himself to the requirements of the case, according to his skill in the use of the various materials. At the present time porcelain may be considered the nearest approach to an ideal material for restoration, but in the hands of the average operator has certain limitations, notably the grinding surfaces of bicuspids and molars where the stress of mastication is very great.

---

*Read before the Northern Illinois Dental Society, at Elgin, October, 1905.

The effect upon the nervous system produced by a protracted gold filling operation should be seriously considered, as it is absolutely prohibitive except to the physically robust and to those of mature years.

It is little less than brutal to subject many people to the nervous strain of having the rubber cloth held in place by a cruel clamp with the salivary glands unduly excited, every blow of the mallet causing exquisite torture, and extending over a period of one, two or more hours.

In this strenuous age, when everybody is strung up almost to the limit of strength, this is a serious matter. We sometimes find instances where malleting causes injurious effects upon the surrounding tissues that will last for years. This is true when the tissues are healthy, and it is very much more likely to happen where they are or have been in a diseased condition.

It is very unwise to subject children to protracted operations and plastic fillings are not always desirable. The gold inlay eliminates many of the unpleasant features mentioned, and has proven to be a boon to suffering humanity. Many otherwise acceptable metal fillings are a constant source of irritation, owing to their susceptibility to the effect of thermal changes. The layer of cement under the hollow inlay protects the pulp to a great degree.

Very many teeth are condemned to be cut off for gold crowns that might better be restored with gold inlays. I think the most extreme case I have had was one where the mesial, distal and lingual walls of a molar were broken down almost to the gum line, cavity extending into the pulp chamber, and leaving only a strong buccal wall in place. The full contour was restored, and I believe the conditions are nearer normal than they would have been if a crown had been used. One end of a short bridge was attached to this and it served its purpose admirably.

The gold inlay is well adapted to use as abutments for fixed bridges and to hold attachments for removable ones.

The gold inlay has been used by some operators for a number of years. My attention was first called to it some twelve or fifteen years ago, and I have worn one in my own mouth, with a great deal of comfort, over ten years.

I have had occasion to make a great many inlays during that time, but it was not until the hollow gold inlay was evolved that I felt very well satisfied with the results obtained. The cavity should be prepared along the lines accepted today as the proper preparation for a gold filling, with the decayed portion thoroughly removed and frail walls broken down. The general shape should be such that the stress of mastication has a tendency to press the gold against solid tooth structure, and not depend upon the cement to hold it in place.

There should be no overhanging walls. The angle formed by the floor and side walls should be slightly oblique, and all margins should be carefully beveled.

If the pulp has been devitalized, and sometimes in large cavities with the pulp alive, it will be found desirable to partially fill the cavity with cement, forming the floor and side walls to suit the case.

There are various methods of constructing the hollow gold inlay, some of which have been described in the dental journals. I will not cover the entire field, but confine myself to one that is of quite general application, and that is especially useful where the cavity is easily accessible and where the time is limited.

The matrix is formed of a piece of pure gold, 36 g., burnished to fit the cavity. It may be necessary to anneal the gold several times during the burnishing process, but before the last annealing punch a hole in the bottom of the matrix with a plate punch, and with sharp-pointed scissors cut an opening large enough to admit the passing of pieces of solder. Also trim the edges so that they will extend a trifle beyond the beveled margins of the cavity. Replace in the tooth and adapt to all parts of the cavity—especially see that the margins are perfectly burnished to place. Remove and flow a little solder around the opening on the concave side and replace in the cavity. Then, if the cavity extends to the proximal surface, use a matrix of metal the thickness of gold to be used for the contour. Take a bite in modeling compound, being sure that it fills the cavity and extends beyond the margins. At this point, if you wish to finish the case at the same sitting, remove the matrix and carve the compound to the required shape. Then burnish a piece of pure gold, 36 g., over this, extending a little beyond the margins all around. Remove both contour and matrix from cavity. Soften and take out the modeling compound. Paint a little flux on concave surface of the contour; grasp the same with soldering pliers by the extended margin; hold with concave side up and drop the matrix into it; with a little manipulation it will go to its place. Drop a little solder through the opening and solder the pieces together at one point, preferably near the cervical margin. The bite may then be proven by trying in the tooth. If it is all right, complete the soldering by holding in the pliers and dropping pieces of solder through the opening and passing slowly back and forth through a Bunsen flame.

This method of soldering will answer for the majority of inlays, but a very large one will require different treatment. Bend a piece of wire so that it forms a loop large enough to hold the case, and pass back and forth through the flame, the same as before. After soldering is completed the margins should be ground down and the final finishing done in the mouth.

If it is not convenient to have the patient stay for the completion of the work, the procedure is a little different. Do not use matrix in taking the bite, but allow the modeling compound to go between the teeth and extend over the margins. Remove bite and matrix and run a plaster model. When this is hard, carve the modeling compound to the desired contour. Having the imprint of the opposing and approximating teeth as guides, it will not be necessary to use an articulator.

The cover or contour gold is then burnished to the model and the further procedure is the same as before described.

This operation, like every one we are called upon to perform, can only be brought to a successful conclusion by extreme care and close attention to detail.

TREATMENT OF FRACTURES OF THE INFERIOR MAXILLARY BONE.*

BY ARTHUR D. BLACK, M. D., D. D. S., CHICAGO, ILL.

In presenting this paper on the treatment of fractures of the inferior maxillary bone, it is not my intention to review the literature of the subject, further than to call attention to the fact that improvement in methods of treating these cases has progressed with the development of modern dentistry. The real beginning of dentistry as a profession was in 1839, when the first dental journal was published and the first dental college established. Previous to that time, no definite methods of treatment of these fractures had been practiced. Many attempts had been made, with more or less success in individual cases, to immobilize the fragments in fractures of this bone by appliances attached to the teeth. Cases are reported in which a strip of metal was bent to correspond with the curve of the dental arch and was held in place by ligatures tied about the teeth. Occasionally a physician reported a case which he had treated by some method devised for the particular case, yet no attempt seems to have been made to formulate rules for the treatment of this class of fractures and in most cases similar methods were used as in the treatment of fractures of other bones; splints to fit the chin and bandages to hold same in position.

Members of the dental profession were quick to recognize the fact that appliances attached to the teeth offered the best means of immobilizing fractured lower jaws. Very early in our dental literature we find reports of cases in which dentists were called in consultation and appliances to be fastened to the teeth were made and used to hold the fragments in position. So far as I can learn, the first interdental splints were made of metal swaged to fit over the teeth, one piece for the teeth of the lower jaw and one for those of the upper. The two were soldered together, and the teeth were placed in them and held by a bandage about the head. Dr. W. W. Allport, of Chicago, made such splints for two cases in 1858, and I am quite certain that similar splints were made at least several years earlier.

---

*Read before the Kankakee District Dental Society, October 26, 1905.

In 1858 vulcanized rubber was first introduced for artificial dentures and three years later, in February, 1861, Dr. T. B. Gunning, of New York, first used vulcanized rubber to make an interdental splint. Dr. Gunning has frequently been given credit for having made the first interdental splint, but this is probably not correct, although the quotation given below shows that he treated his first case of fracture in 1840. Dr. Gunning certainly deserves great credit for the advancement made in methods of treating these cases.

There are certain difficulties to be met with in the treatment of fractures of this bone that are not present in most other fractures. There are fourteen pairs, twenty-eight muscles in all, attached to this bone. Of these four pairs are for the movement of adjacent soft tisssues, while ten pairs are attached to other bones and are therefore to be considered in the fixation of this bone. It is out of the question to keep at rest the four pairs which are attached to the hyoid bone, as these muscles are in almost constant movement in the acts of deglutition and talking. The attachment of the muscles that close the jaw is practically entirely to the ramus (exception, the weak buccinator), while the attachment of the muscles that depress the bone is practically entirely to the body of the bone. Thus, there is no direct opposition of muscular tension at any given point. It is impossible to place splints on two sides of this bone, as can be done with many other bones. It is almost impossible to keep a bandage on the head sufficiently tight to prevent jaw movement. Other difficulties peculiar to these fractures are those of feeding and asepsis. That Dr. Gunning quickly recognized many of these difficulties, is shown by the following quotation from a paper by him published in 1866.

"In the year 1840, when treating the first fractured lower jaw placed in my care, I found treatment by bandages, etc., unreliable. For, while the muscles tend to displace the bone, bandages frequently increase the difficulty, especially when swelling sets in through their pressure. They also, by interfering with the circulation, tend to prevent union. Teeth, loosened by the injury, are left unsupported, and the motions of the jaw, cheeks and lips painfully restricted.

"Of the contrivances invented to supplement bandages, many were even more objectionable, and little improvement has been made in general treatment up to the present time. Having successfully used the interdental splints in many cases which had proved unmanageable under the usual treatment, I am convinced that they are superior to all other appliances."

The results to be obtained in the treatment of fractures of this bone are not identical with those of other bones. The proper occlusion of the teeth requires primary consideration, excepting in cases where complications are of more importance than the fracture itself. While it is always important to have the least possible deformity in the union of the bone, that is of secondary importance to the occlusion of the teeth. In cases where a section through the bone is lost, we may often secure good occlusion at the expense of the bone alignment, where proper bone alignment would destroy the occlusion. A case in point would be one in which a gunshot wound might cause a section of the bone in the posterior part of the mouth on one side to be lost. If the fragments should be approximated so that the lower border of the bone would be smooth when union had taken place, the teeth would be drawn to the injured side enough to destroy the occlusion. If, on the other hand, the teeth are held in proper occlusion the masseter and temporal muscles will draw the posterior fragment forward and upward against the anterior fragment, and we will get union with deformity in the bone, but proper occlusion of the teeth.

The etiology and symptoms in these cases are so similar to the etiology and symptoms of fractures of other bones, that it is not considered necessary to review them in this paper. I will only call attention to the fact that most fractures occur in the body of the bone in the region of the mental foramen, and less frequently as we proceed in either direction from this foramen, being rare at the symphysis. In addition to the symptoms present in fractures of other bones, there will generally be one or more loose teeth at the line of fracture, and the patient will complain of inability to properly close the mouth or to masticate food. It frequently happens that the patient comes for the treatment or removal of the loose teeth, without knowing that the bone has been fractured.

The displacements of the fragments will, as with most other fractures, depend on two things: first, the tension of the various muscles, and, second, the line or direction of the fracture itself. In single fractures of this bone in which the overlapping of the fragments does not prevent the natural displacement caused by muscular tension, it may be stated that the greatest deformity occurs in fractures just forward of the attachment of the masseter muscle, in the region of the second molar tooth, and the deformity is gradually less the farther the break occurs from this point toward the symphysis. When the break is near the symphysis the pull of the muscles of the two sides of the jaw is nearly equal and there is little or no displacement. When the break is in the region of the bicuspid or molar teeth, forward of the masseter muscle, that muscle elevates the posterior fragment and the internal pterygoid and fibres of the mylohyoid draw it inward, while the longer anterior fragment is drawn to the side of the fracture by the internal pterygoid of the opposite side and the muscles attached to the hyoid bone. Fractures within the attachment of the masseter cause little displacement, as the fibres of this strong muscle hold the fragments in position, and in fractures at the angle, the internal pterygoid assists. If the break is in the ramus, the temporal muscle may cause a slight opening of the break on the anterior side. The direction of the line of fracture may prevent the ordinary displacement in any case.

In the treatment of these cases, many devices have been made since the introduction of the first interdental splints, all on the principle of securing immobility by means of appliances attached to the teeth. Most of these have been more or less cumbersome and unsightly, requiring straps, pads or bandages under the chin or over the head. The early vulcanite splints were made in several forms, the most common being a piece that fitted over both the upper and lower teeth, holding the mouth open a little and having an opening in the front for feeding. This was held in place by a bandage about the head. Dr. Gunning made splints in the early 60's that were applied to the teeth of the lower jaw only and were held in place by screws entering the crowns of several teeth so that the mouth could be opened and closed. The upper surfaces of these splints were made to correspond to the occlusal surfaces of the upper teeth and the patient could masticate food, using the upper surface of the splint instead of the lower teeth. Another form was a splint applied to the lower teeth only, which had two metal projections attached to the rubber; these extended forward outside the mouth and were turned backward alongside of each cheek and a bandage or pad passed under the chin from the metal rod on one side to that on the other. With this splint also the mouth could be opened and closed. This is generally known as the Kingsley splint, although both Dr. Kingsley and Dr. Gunning claimed priority. Many "universal splints" have been introduced, but owing to the great difference in the size and shape of the jaws and teeth, and also to the introduction of more simple and less cumbersome methods, none has found favor with many men. The most important method since Dr. Gunning's time is that of holding the teeth of the two jaws together by means of wires, first suggested by Dr. Gilmer. Dr. Angle's method of attaching bands on the teeth and connecting these bands with metal bars or wires, should be mentioned.

The method of treatment employed in any case should be decided upon with the following in view: First, maintain immobilization for as long a time as may be necessary and in such a manner as to insure proper occlusion of the teeth after union has taken place. We can be absolutely certain of the occlusion if we are able to see the surfaces of the teeth at all times and also see the relation of the lower teeth to the upper, and the more nearly the lower teeth are closed against the upper, the more certain are we of the occlusion. Second, there should be the best possible access to all the tissues involved, both inside and outside of the mouth for the treatment of complications. Third, the advantage of cleanliness. From this point of view the method which will allow the frequent and thorough cleansing of all parts of the mouth is the most desirable. Fourth, the advantage of allowing the free use of the jaw as soon as possible for the purposes of mastication and talking. Fifth, the inconvenience to the patient of any appliance externally on the head or face which would prevent him from attending to his regular duties during the healing process and would keep many patients from taking daily exercise out-of-doors. Sixth, there should be as little pressure as possible, or none at all, on the soft tissues, on account of interference with the circulation and discomfort to the patient.

What methods may be employed that will in the majority of cases comply with the above? Before presenting the two methods to which I wish to call your particular attention, let me emphasize the following statement: the large majority of cases of fracture of the lower jaw should be treated without the use of a bandage or any form of splint externally. In other words, so far as the immobilization of the parts is concerned, it is not necessary in the large majority of cases to apply anything whatever on the outside of the head or face.

The exceptions to the above are: First, cases in which an insufficient number of teeth remain to enable us to use them for immobilization; second, cases in which there are complications, such as external wounds, requiring pads and bandages, or multiple fractures, with or without complications, which indicate the use of external appliances. However, many cases of multiple fractures, and many cases with complications, can be best treated without external appliances.

I think that fully nine-tenths of all cases of fracture of the lower jaw should be treated without any external appliance on the face or head. This means that practically all of the mechanical devices that have been made, and all patterns of interdental splints which rely on pads *or* external splints and bandages to hold them in place, are not considered as being the best service that can be rendered in the large majority of cases.

The two methods that I wish to present are not new, yet neither is sufficiently well known. The first is the method of wiring the teeth of the lower jaw to the teeth of the upper jaw. This method was first used by Dr. Thomas L. Gilmer, of Chicago, in 1886. It is by far the most simple of any and is applicable almost universally. Practically the only cases where this method can not be used are those in which an insufficient number of teeth remain, and rarely where complications, such as four or five breaks of the bone, may make this method alone insufficient.

Wires are twisted about the necks of several teeth, not less than two on each side of the mouth, of both the upper and lower jaws. The fragments of the fractured lower jaw are then held so that the teeth of the lower jaw occlude properly with those of the upper, and the twisted ends of each of the wires on the lower teeth are united with the twisted ends of the wires on the upper teeth by again twisting them. By this means the lower teeth are securely fastened to the upper and the fragments of bone effectually immobilized; no bandage or other applience is used. The teeth are in absolute contact in proper occlusion and are in plain view at all times. Good opportunity is afforded for the treatment of complications and for thorough cleanliness. The buccal and labial surfaces of the teeth may be scrubbed and in most cases the lingual surfaces may be cleaned with a curved nozzle syringe. The patient is not bothered by any appliance on the outside of the face or head and can go about his business without attracting attention. There is nothing whatever in contact with the soft tissues, giving perfect freedom of circulation and no danger nor pain from pressure. The one point in which this method does not fulfil our desires is in the matter of feeding. Patients are necessarily kept on a liquid diet, which might seem to some a serious disadvantage, but scores of patients so treated have progressed splendidly, notwithstanding the fact that many complicated cases have been kept wired much longer than the time generally required for union. I found it necessary to keep one patient's teeth wired for fourteen consecutive weeks and he attended to his regular work after the first week or ten days.

There are many little details in connection with this method that must receive careful attention if the most satisfactory results are to be obtained. The wire used must be of a size that will easily pass through the embrasures between the teeth, 22 or 24 gauge, soft and pliable, must not stretch, and yet be strong and tough. German silver wire is best, and it must be carefully annealed. It should be cut into pieces two or three feet long and each piece rolled up in a small roll an inch or two in diameter. These rolls should then be invested in a mixture of dental plaster and pumice, and annealed by heating with a blow-pipe for ten or fifteen minutes. All of the wire should be enclosed within the investment so that no part of it will be reached by the direct flame. In this way all of the wire is evenly annealed and there are no weak points, as there are apt to be if the wire is passed through a flame. The proper preparation of the wire is extremely important as it is very annoying to have a wire break during the operation of wiring the teeth or afterward, and it is often difficult to replace a broken wire after the teeth have been drawn together.

When it has been decided to treat a fractured jaw by this method it is advisable to first mark on a dental chart the teeth of each jaw to be wired. At least two teeth on each side of both the upper and lower jaws, eight teeth in all, should be wired, and occasionally it will be necessary to wire twelve or more. The relation of the teeth selected in one jaw to those of the other should be noticed and a piece of the wire to be used should be passed through the embrasures on both sides of such teeth to be certain that there is sufficient space. There will generally be room to the gingival of the contact point for the gauge of wire mentioned. However, occasionally two teeth will be too close, and neighboring teeth should be chosen. A group of four teeth on either side of the mouth, two upper and two lower, should be selected so that the wires from the two upper teeth may be united with the wires from the two lower teeth in the form of a cross. This arrangement will prevent lateral as well as up and down movement. It is desirable that the teeth chosen for the wires shall be marked on a chart to avoid confusion in the operation. When, for example, wires have been placed on eight teeth, we have sixteen wire ends projecting from the mouth and the chart is an aid in bringing the proper ends together.

After the chart has been made, a sufficient number of pieces of wire, each about four inches long, should be cut. Then a wire should be passed around the neck of each tooth selected and twisted tightly on the buccal side. The point at which the twist leaves the tooth should be toward the mesial or distal side of the buccal surface, according to the position of the tooth of the opposite jaw that is to be connected with this tooth, otherwise the wire will slip around the tooth afterwards and be loosened. It is best to place the first wire on the tooth selected that is farthest back on each side of each jaw, and work forward. The ends of the wires should not be cut off at this time, but left projecting out of the mouth, to prevent injury and irritation to the cheeks. All the wires should be twisted in the same direction, say to the right, to prevent untwisting when those on the lower teeth are united with those on the upper by again twisting.

When wires have been placed on all of the teeth selected, the fragments of the lower jaw are held as nearly in place as possible and the wires on the lower teeth are twisted with those of the upper according to the chart previously prepared. The teeth can generally be drawn into proper occlusion without difficulty. The ends of the wires should then be cut, leaving the final twist about three-eighths of an inch long. The ends should then be turned back so that they will stand against the surfaces of the teeth, thus leaving a smooth surface to come in contact with the soft tissues. There may be enough slipping of the wires during the first forty-eight hours to require a little additional twisting; they will then generally hold the jaw without further attention.

The patient's stomach should contain no solid food at the time the teeth are wired. If solid food has been taken a few hours previously, it is advisable to give a cathartic and place a bandage about the head to support the parts temporarily until the next day. This will prevent the possibility of any food being aspirated into the lungs in case of vomiting. It is, of course, not necessary to give an anesthetic for the operation of wiring the teeth.

The question has often been raised as to whether or not the teeth are loosened by this method. Observations of many cases show that they are not loosened. One or more teeth near the line of fracture are generally loose when the patient presents or may become so by infection. Such teeth should not be wired.

The feeding of such patients is very simple. They are necessarily confined to a liquid diet, and may have a variety of soups, broths, milk, coffee, soft boiled eggs, breakfast foods, and almost any liquid or semi-liquid form of nourishment. In most cases one or more teeth will be missing, which will make feeding easier, although one can take liquids without difficulty with all the teeth present and the jaws wired tightly shut.

As previously mentioned, this method is applicable to almost all cases of fracture of the lower jaw, with or without complications. Occasionally, where there are multiple fractures, or there is delayed union, it is necessary to wire two fragments of the bone by drilling holes through and using silver wire. In such cases the teeth of the two jaws may also be wired to hold the parts at rest. This method of wiring the lower to the upper teeth is particularly good for fractures near the angle of the bone, cases that have often been treated by wiring through the bone, which is generally unnecessary. In such cases, it is only necessary to hold the teeth in proper occlusion and the traction of the muscles will hold the fragments together.

The only fractures in which it is preferable not to use this method are those occurring in such positions that there are several sound teeth on either side of the line of fracture. For such cases I wish to present another method which has the advantage of allowing the patient to masticate food after the first few days. This is by the use of a vulcanized rubber splint fastened to the lower teeth only, similar to the splint made by Dr. Gunning years ago, but secured to the teeth by cement instead of screws.

The detail of making it is as follows: Impressions of the teeth of both the upper and lower jaws are first taken with dental plaster. No attempt should be made to hold the fragments of the lower jaw in proper relation. The impression of all of the lower teeth may be taken at once or in sections. Plaster is then poured into these impressions and models made. The model of the lower teeth is then sawed apart at the line or lines of fracture, or if it has been taken in sections, each section is trimmed so that they may be placed together with the teeth in their proper relation. The model of the upper teeth is then placed on an occluding frame and the sections of the lower model are placed with the teeth in proper occlusion with the upper teeth. The sections of the lower model are held together temporarily with wax, and then fastened to the occluding frame with plaster. We should now have exact models of the upper and lower teeth as they were before the fracture occurred. Wax is now placed on the lower model in the form that we wish the splint to be, covering the occlusal surfaces and extending about half way to the gum on the lingual, buccal and labial. This should include all of the teeth present. A little more than the thickness of one layer of wax is sufficient. While this wax is on the lower model, the teeth of the upper model should be pressed gently against it, just enough so that the cusps of the upper teeth will indent the wax. The wax splint is then removed and reproduced in vulcanized rubber. A number of holes, corresponding to the occlusal surfaces of the lower teeth should be drilled through this splint to allow the excess of cement to escape. The sockets in which the lower teeth fit must generally be slightly enlarged to allow the teeth to slip fully into them, or the plaster model may be covered with tin foil before making the wax splint, which will give the necessary enlargement of the sockets.

The splint should then be tried in the mouth and trimmed further if necessary to get the teeth into place. The lower teeth should then be dried as thoroughly as possible and the splint cemented on, the fragments of the jaw being supported until the cement hardens. An hydraulic cement is preferable for such cases, as the cement used is apt to become moist in a few minutes and the hydraulic cement will set the more quickly under such circumstances.

No other appliances are necessary. The patient is able to open and close the mouth and after a few days can masticate food fairly well, since he has a good occlusion of the upper side of the splint with the upper teeth. In a case of simple fracture so treated, the patient will suffer little inconvenience after the first few days and can go about his regular duties without attracting attention.

This method has a more limited application than the wiring method, as there must be several teeth present in each fragment. It requires much care in every detail, for it must fit perfectly to be successful. If the teeth are not held in their original positions there will be faulty occlusion or the ends of the bone will not be held in apposition and faulty or delayed union may result.

The method of wiring may be used for any case in which the splint could be used and with as satisfactory results, the particular advantages of the splint being the free movement of the jaw and the ability of masticating food. It also gives a little better opportunity to keep the parts thoroughly clean. All other requirements are fulfilled equally well by either method.

In the treatment of any case the time that will be required for union will depend on the conditions present, but usually from three to four weeks will be sufficient in simple fractures, or after suppuration has ceased in compound fractures.

FAILURE OF FILLINGS.*

BY DR. W. A. HOOVER, GIBSON CITY, ILL.

Mr. President and Gentlemen of the Central Illinois Dental Association:

We all know why the fillings put in by the man across the street fail. The trouble there is that the college should have sent him back to the farm when he first attempted to enter or should have "plucked" him every time he came up for an examination. He does not know the first principle of dentistry, and probably never will. We will not attempt to explain his failures, but when really competent dentists like ourselves have failures there should be some fitting explanation for the occurrence. (These remarks about our brother dentists should perhaps be labeled, for at least one good brother took them seriously when they were shown to him. He, however, has some excuse for it in the character of his competitors.)

But, speaking seriously, let us not judge our neighbor too harshly. Don't be too sure that he does not have good reason for the same opinion of your work that you have of his. You are quite likely to see more of his failures than of his perfect work for obvious reasons. None of us are perfect and if we will look back we can each of us call up some case that we would dislike to be judged by.

There are many things that enter into the question of failure of fillings.

Imperfect preparation of cavities is by far the largest factor in the problem. This one thing covers nearly the whole ground.

The dentist who practices extension for prevention, either in its extreme form or with modifications to suit the cases, can trace the recurrence of decay to faulty preparation. Possibly in order to avoid a display of gold or to save time—to save pain to the patient, or from laziness and a desire to do the easy thing rather than the best, a compromise was made. A compromise in most things of life only postpones the day of reckoning and this is especially true in the preparation of cavities. No man has done more for dentistry than the man who brought forward and explained the principle of extension for prevention. For while many do not follow its extreme teachings there are few who have not modified their cavity preparation to conform in a measure to its requirements.

---

*Read before the Central Illinois Dental Society, September 19, 1905.

Much has been said about the advantages of associated effort and of the benefits to be derived from belonging to the state society. Still many of the dentists of the state do not half appreciate them. A single paper read before the state society at Peoria in 1897 is worth all any dentist will ever expend going to society meetings. The author, Dr. W. E. Harper, while disclaiming credit for the subject matter in the following quotation, "I have here made only a nosegay of flowers and have brought nothing of my own but the string that ties them," gave an admirable classification of cavities and rules for their preparation. It was the most practical paper ever heard. The string that he ties them with is a good strong one and the dentist who "holds on to that rope" will find the character of his work changed for the better.

Of course, mistakes will be made, but these will be individual and not the fault of the system. Slipshod work at any stage of the operation, from the beginning to the end, will invite failure.

Granting that every cavity has been faultlessly prepared there still remain some reasons why fillings may fail. An attempt to introduce a gold filling without proper access is very apt to end in failure and the dentist who prides himself on not showing gold may show something much worse—a discolored plate of enamel—but this gets us back to imperfectly prepared cavities. Still a cavity may be prepared correctly and only lack proper separation of the teeth to make a good filling possible. Fracture of frail walls and consequent failure of fillings would be traceable to faulty preparation.

Imperfect work in the introduction of the filling will account for some failures. The gold filling unless thoroughly condensed and the adaptation to the walls perfect can be but a failure and after its introduction unless finished properly will only invite recurrence of decay by its overlapping or imperfect margins.

Some years ago a prominent writer who has earned a right to be considered an authority, made the statement that it made little difference in the shrinkage and expansion of amalgams whether much or little mercury was used. This does not seem to be correct in practice no matter what the theoretical tests show.

The best results are obtained by working the amalgam as dry as possible and with sufficient force to bring surplus mercury to the surface.

It may be possible to work it too dry, but it is a safe proposition that for every amalgam filling that has too little mercury there are hundreds that have too much. Manufacturers and experimenters have improved the quality of amalgams until little can be expected in that direction but proper manipulation of a poor amalgam will give better results than slipshod work with the best alloy on the market.

Failure may be due to mistaken judgment in the selection of filling material. Gold and porcelain are accepted as reliable materials for the filling of teeth, but the dentist who uses either everywhere and in all cases is nearly as far wrong as the one who uses amalgam or cement exclusively. Each has its own proper place as a filling material. A good amalgam filling is better than a poor gold filling. As to a good cement filling that is a thing of the future—it will come some time, possibly too far in the future to be of any benefit to those who are practicing today.

Dentists are perhaps more negligent about instructing patients as to the necessity of caring for their teeth than of any other of their many duties. You hate to be constantly telling people that they neglect their teeth. It is almost like your physician telling you that you need a bath, but even that becomes necessary sometimes and the dentist who expects the best results must secure the co-operation of his patients.

You may "extend all cavities until the margins will be beneath the gum or be self cleansing," but you will find that they will *not* clean themselves.

Fillings have always had a habit of failing and probably in a measure always will, but when a filling comes back defective, don't say "soft teeth." Of all poor excuses for poor work this is the worst. Every dentist recognizes that there is a vast difference in teeth, but this "soft teeth" business is worn threadbare and should be laid on the shelf by every self respecting dentist.

THE BANDLESS PORCELAIN CROWN.*

BY DR. U. M. RICHARDSON, CHICAGO.

After several years I have concluded that for incisors, cuspids, bicuspids and molars the so-called Richmond crown, the baked porcelain crown, or any other crown with a band is not fully up to that high standard of excellence which is demanded when it becomes necessary to replace the natural crowns of the teeth.

In presenting this paper it is not my purpose to extol the merits of a new crown, but rather to direct attention to some of the advantages resulting from the use of the bandless baked porcelain crown.

Before mentioning the advantages of the bandless crown over those with a band encircling the root of the tooth, I will briefly refer to some of the disadvantages of the latter. First, perhaps, in importance is the irritation of the gum resulting from the presence of the band underneath the free margin of the gum.

Although the band may be fitted with great care, so that apparently there is no projection between the band and the root, and even though it be ever so thin it acts as a foreign body and is a constant source of irritation, however slight it may be. If the band is fitted so as to be entirely under the gum, it is the observation of critical dentists who have made it to their interest, observing the results from the Richmond crown, that the band not only becomes visible after a short time, but more than that, at the point of junction between the band and the root there is a seat of irritation resulting in absorption and its sequelæ.

It is not natural to have a foreign substance occupying the space between the free margin of the gum and the tooth. After the gum has receded from the band that portion exposed becomes unhealthy, invites decomposition, resulting in decay.

It should be our constant endeavor to conceal the line of junction by our art, therefore some method should be followed whereby the joint between the crown and the root can be permanently concealed. As the gum will sooner or later recede from the band, the latter will then be exposed to view.

---

*Read before the Wisconsin State Dental Society, Oshkosh, July, 1905.

At the base of the body of a baked porcelain crown with a band there is a space between the porcelain and the platinum cope, since porcelain and platinum do not unite. This space in many cases causes a dark blue line to appear at the joint between the porcelain and the metal. This latter unsightly and unartful condition is due to the penetration and decomposition of secretions and is, of course, decidedly objectionable. It is impracticable to prevent the darkening in the region of the cope of the crown from being transmitted to the porcelain at its base, thereby causing an unnatural appearance.

Among the advantages of a bandless porcelain crown over any crown with a band are the following: A bandless baked porcelain crown when plate, post and facing are used, if the plate is properly burnished to the root to be crowned and the facing soldered to the post, the facing being ground so as to have the same contour as the end of the root and polished so as to have a smooth surface throughout is perfectly healthy and non-irritating to the gum, because it has practically the same contour and a similar surface to the original tooth. The gum between the crown and the tooth will remain intact and perform its normal function, and the liability to irritation is reduced to minimum since the crown and the root form one continuous smooth surface and are more harmonious to the gum tissue.

In the Logan crown the union between the crown and the pin is the strongest that can be obtained, because the crown is constructed of one mass of porcelain which has been molded and baked with a high fusing body. I can not see any advantage in confining one's efforts to the use of any style of crown which does not afford the greatest possible variety of molds and shades as the ordinary facing. It is my belief that all ready made crowns should never be adopted as they were originally designed and intended for no other than temporary purposes.

In the baked bandless porcelain crown that I make, the root is ground even with the gum margin by means of a thin carborundum wheel. The root is trimmed to the free margin of the gum with a convex surface and cut under the gum on the labial and lingual sides as far as possible without injuring the gum. The end of the root is made to follow the outline of the gum, being highest on the labial and lowest on the lingual side. By cutting the groove in the center of the root from labial to lingual there is more space for the porcelain around the post. This lessens the rotary movement and gives more space for fusing the porcelain to the facing and also lessens the tendency of the plate to draw up from the lingual portion of the root, reducing the liability of fracture of the baked portion of the porcelain that is baked to the facing.

The cutting of the groove and trimming the edges of the root is best done with a large inverted cone, but at high speed. If the handpiece is held firmly and a sharp bur is used there is slight discomfort to the patient. My reason for trimming the root under the gum is that the joint is entirely protected by the gum and the porcelain of the crown being smooth, there is no room for accumulation of food and there will be no recession of the gum.

The most permanent means of attachment of a crown is cement. Another objection to a crown with a band is mounting the crown upon the root. After the canal has been dried and filled with cement the crown is forced into its proper position and the only means of exit of the surplus cement being between the band and the root, the cement is forced against the gum, thereby causing the patient to suffer pain from pressure and irritation of the cement. When the bandless crown is set the surplus cement flows straight out from between the crown and the root without inconvenience to the patient.

In fitting the bandless porcelain crown to the root, if the same care is taken as in fitting the band the operator then can reproduce the natural crown of the tooth in every way. You have a crown as near perfect as any crown can be.

CLEANLINESS A DUTY TO OUR PATRONS.*

BY E. M. KAPITAN, D. D. S., MANITOWOC, WIS.

In bringing this subject before you it is not my intention to give you a deep scientific paper, but simply to call your attention to the lack of cleanliness about the operating room with special reference to the operator's hands and instruments.

Many operators of good reputation too often forget the importance of cleanliness as a duty to their patients. In offices where an assistant is not employed and the operator's time is engaged at the chair or in the laboratory we can not expect even an attempt at keeping the operator's surroundings reasonably aseptic. Cleanliness is akin to godliness. It is the first principle of aseptic surgery.

Sir Joseph Lister may well be called the father of antiseptic surgery, for undeniably it was through his demonstrations that the gates were thrown open inviting modern surgery to a field rich in the alleviation of suffering humanity.

Let us differentiate between the terms antisepsis and asepsis, for there is a vast difference in their practical meaning and the lack of the latter will necessitate the former. Inflammation is a bacterial invasion of living tissue after an injury or at a time when nature is so impaired that the normal cell elements can not resist their attack. Infection occurs through a solution of continuity of the skin or mucous membrane whether caused by inoculation during surgical operation or otherwise.

In this century of progress in every branch of our profession we have the subject of porcelain inlay and extension for prevention thoroughly discussed at every meeting and written of in every journal until we find that it is a play to the galleries, and other important subjects are neglected, and after all is said and done we may safely say that there is no principle in operative dentistry that is so universally neglected as that of cleanliness. Have we made any advancement towards practicing aseptic dental surgery? I say no. Here is a field occupied by a countless number of germs.

Often those who demand our attention are suffering from an abscess, a circumscribed cavity containing pus, or a very common occurrence, a mouth filled with roots and broken down teeth festering in a bath of pus; mucous patches and other specific forms of dangerous diseases. Can aseptic surgery be practiced in the mouth? I say no. We must rely on antisepticism. You may say antisepticism is imperative in all surgical operations. Why do we not have pyemia septicemia or a host of evils following the removal of such roots and teeth in all cases? May it not be that some patients are immune to germs which are cultivated upon themselves, or is it because this region has some special resistive power in some instances? There must be a charm, for the countless number of teeth extracted with a total disregard for cleanliness, not to mention sterilization, is a fact which can not be denied. We do not hear of patients dying from tooth extraction, but we do see patients who have suffered with ulcers, sloughing, osteitis, etc., for weeks after such operations. These beyond a doubt could have been prevented if reasonable cleanliness had been exercised by the operator. It is not a very uncommon occurrence for a careless dentist to extract a tooth, lance an abscess, or perform some act of minor surgery and then wipe his instrument with a towel or, perhaps, use a little cold water, and place it in the drawer. Has there been any precaution used? Patient number two comes along, the same instrument is used. It is not even placed in an antiseptic solution this time. A tooth may be broken in an effort at extraction. After several efforts to remove the roots, digital examination is made. The finger is probed into the hole and the roots felt for. This finger has been in a dozen mouths, has handled all sorts of things, possibly money (and a better breeder for germs than money is hard to find). The fingers may have been washed with a little cold water and strongly scented soap. This patient is dismissed without even a suggestion that he use a mouth wash.

---

*Read before the Wisconsin State Dental Society, Oshkosh, July, 1905.

An abscessed tooth is treated or putrescent pulp is removed with a broach. A little later another tooth is to be treated, perhaps pulp is to be removed under pressure anesthesia. The same broach is taken up and the pulp twisted out. It may be that an abscess with a festulous opening is to be made antiseptic. The broach used in the other case is manipulated and, perhaps, the gum may be probed with this broach. Is it aseptic? Undoubtedly no. If there are such things as germs they are present in this instance. A knife or smooth dress-probe might possibly be wiped clean, but such can not be done with a nerve broach.

Suppose an injection of an anesthetic is to be made. A syringe and needle need to be used. There is no telling how many times nor for how many purposes either of them may have been previously used. Possibly not even all the fluid has been removed from the barrel of the syringe or the needle is dipped in some antiseptic solution, a bottle of which has been left open for some time and the same needle has been dipped into it again and again after having been first in one gum and then in another. Has it been made sterile? Undoubtedly no. Then are we not in duty bound to protect our patients? Is it not a moral obligation that we owe to them, our profession, and ourselves? Disease and death often go with dirt we can not see. It does not cost much in time to bring about a reasonably safe aseptic condition of our operative surroundings.

First let us take care of the hands. Absolute hand disinfection is impossible. We can not rid the hands of every bacterium chiefly because of the presence of the Staphylococcus epidermi dis albus which inhabits the deep portion of the skin. A thorough use of nail brush and green soap with hot water is, to my notion, the most practical way of keeping the hands reasonably clean. After this is done the finger nails should not be neglected. Never use perfumes or strongly scented soaps to conceal odors which may be about the hands or instruments. Never go from one patient to another without a hand wash. It matters little how careless the patient may be himself, he appreciates, to a certain extent, cleanliness in others.

As to the sterilization of instruments, forceps, excavator, knives, clamps, etc., there are various methods suggested, most of which are not practical owing to the uncertainty of completely destroying germ life. For my own purposes a sterilizer made of copper is used. I't is practical and inexpensive. All instruments which have been used are taken by the assistant into the laboratory. Those smeared with blood and pus are thoroughly scrubbed with soap and brush and then placed in the sterilizer which contains about a quart of water and a little corbonate of soda to prevent the instruments from rusting. Then heat is applied and they are boiled for twenty minutes. This process insures perfect sterilization. Engine burs and broaches are cleaned with a rapidly revolving wire brush and then placed in pure carbolic acid, there to remain until again needed. The mouth mirror can not thus be sterilized. A thoughtful and cleanly operator will never think of placing a mouth mirror or explorer in the mouth of a patient without first placing it in pure alcohol, there to remain until needed. It can then be washed in water and dried with a napkin.

There are many things of this nature that would require improvement before we can claim to have reached the ideal from a sanitary standpoint. I have attempted to introduce no new ideas nor was it my intention to give to you a deep scientific paper, nor have I exaggerated the conditions which exist in so many of our best dental offices. Although we may never hope to reach the ideal in this matter, let us try to have our own environments so that inoculation of one patient to another may be practically impossible.

THE INLAY PRINCIPLE AS ADAPTED TO INDIVIDUAL PORCELAIN CROWNS.*

BY C. F. RODOLF, D. D. S., MUSCODA, WIS.

Mr. Chairman, Members of the Society, Ladies and Gentlemen—I take this public opportunity of expressing my appreciation of being called upon to read a paper before this society. I also wish to call your attention to the fact that I have somewhat changed the title of my paper, "Porcelain Crowns," to one more specific, namely, "The Inlay Principle, as Adapted to Individual Porcelain Crowns."

The history of crown construction from the old pivot tooth with its wooden peg down to the more modern appliance, has been one of success under trying conditions. With their beautiful contour and proper articulation and a fit that would often disgrace a country blacksmith yet their failures are many and you can trace nearly all to bad fit or lack of proper adaptation.

It has long since been recognized that bands are not the ideal dental appliance, and that they have many features that make them undesirable.

---

*Read before the Southern Wisconsin Dental Association, Racine, May, 1905.

First—They are a constant cause of inflammation as they restrict the interproximal space and afford lodgment for food to be decomposed by pathogenic organisms.

Second—That they are unsightly.

Third—That they fall short of one particular function, that of preventing the fracture of the root. For in order that a band be made to fit, it is necessary to make the root tapering, and as the force on the crown by the occluding teeth is to tip the crown, and as the band is part of the crown, it simply tips off the end of the root.

I firmly believe that if a band should be necessary, due to a frail or a fractured root, that it should be made entirely separate from the crown, or better yet, use an interdental band, as called by Dr. B. J. Cigrand, which is to trephine the root and place the band immediately within the cervical circumference of the root substance, and cement this on separate from the crown.

I have given this considerable study and I am more convinced every day from actual results that the real trouble is not lack of bands upon the roots or crown, but lack of adaptation or proper fit of the crown to the root.

The all porcelain crown as the Logan or Davis, should depend upon a wide base for support and a pin for retention, and if a poor fit, the cement will wear away, leaving little or nothing but the pin for support, and under these conditions we can expect a fractured root.

When the time comes that we can take a block of porcelain and with so crude an implement as a carborundum stone make proper fitting inlays, then will I believe that we can make proper fitting crowns by a like method.

It has been clinically demonstrated that cement will not wear away from a proper fitting inlay, and it was from these facts I began some years ago to try and adapt the porcelain inlay principle to individual crowns.

I prepare the root in the usual way, cutting off the crown with burs and carborundum stones. I then use the different faces in shaping the end of the root. I use them both in the straight and right angle hand piece. I find it very handy to have one with a short shank to be used in the right angle to cut off the roots of the bicuspids and molars, also for cutting off the roots on the posterior surface. I leave the end of the tooth about the shape of the festoon of the gums, but at the same time leaving flat surfaces for a solid base.

I use the Davis or Logan crown, preferring the former, as it has a better pin, but requires the baking in of the pin.

After selecting the crown to be used I proceed as follows: First prepare the tooth as for a Logan crown, paying particular attention to the articulation but not being particular about the fit. I then drop on the pin end of the crown some paraffine wax and with this take an impression of the root with the crown in the position it is to be when finished. Next take some gold or platinum matrix metal as used in inlay work, punch a hole in the center and place over the pin, return this to the tooth and by pressure force it to place. I then use a burnisher to force the matrix against the tooth so as to give a perfect outline. I then remove and invest the pin end of the crown in an investment material so as to retain crown and matrix in exact position. Boil out the wax and fill in the space with Jenkins' Prosthetic porcelain. And right here I wish to say that I find this by far the best of anything I have ever seen, as it will flow in every open space. In fact, I do not know of any other porcelain that will do nearly so well. I usually have to make two bakes of the prosthetic porcelain in order to make up the shrinkage. I then remove the investment and grind off all excess to the outline of the root. I then, if necessity requires, use some of Jenkins' enamel porcelain to give the crown any particular shape or shade that I desire to match the adjacent teeth.

In setting the crown I use Jiffy's cement tubes so as to carry the cement well up into the nerve canal and set the crown under pressure as you would in an inlay, leaving all excess until cement is well set, then crack away with an explorer, as the seam is so thin it will come away in chunks, leaving nothing under the gums.

A few of the advantages of this method are as follows:

First—You can make a proper adaptation to any tooth in the mouth, including the molars and bicuspids.

Second—By use of the different shades you can change all or any part of the tooth to match the adjacent teeth, so that the artificial substitute will not be readily recognized.

WISCONSIN STATE DENTAL SOCIETY, OSHKOSH, JULY, 1905.

Discussion of Dr. Richardson's paper, "The Bandless Porcelain Crown."

Dr. W. H. Chilson:

The subject is one that has engaged my thoughts very much in connection with substituting artificial crowns, and I believe most thoroughly in the position he has taken, viz., that a crown perfectly adapted to the root of the tooth, without a band, relieves the possibility of irritation caused by the projecting edge of a band. He has argued the point so well that it seems to me it commends itself to each one of us. The only doubt I have at all in that kind of a crown is its durability. In the number of years' experience I have had in substituting crowns I have found that the band is material to the strength; it holds and binds together the entire work. I would be glad if that could be removed, and the strength maintained.

Dr. Richardson has so thoroughly covered those points in his paper that I see no possibility for a difference of opinion, and I hope, therefore, that that practice has come to stay; that we may produce porcelain crowns set upon a root without the bands and have the joint come under the free margin of the gum and not irritate, and yet maintain the strength. If that can be done it seems to me the crown is really ideal.

Dr. C. F. Rodolf:

I have been termed a bandless crank for a number of years. Five years ago I gave a clinic at Madison to demonstrate that the band would not prevent fracture at the root. I don't know whether the men in the society agreed with me at that time or not. About four weeks ago, at the Southern Wisconsin Dental Association meeting, I read a paper upon the bandless crown, in which I mentioned this fact, and several came to me afterward and stated that the band absolutely will not prevent fracture of the root.

There is one point that the essayist mentioned about the Logan crown, and that is the porcelain being used upon the platinum pin. I object to the platinum pin. I think it is the poorest metal for bridgework, or in connection with the crown, or teeth in plates. I think a pin cemented in porcelain, as in the Davis crown, is fully as strong as the one fused in the porcelain.

Dr. James S. Danforth, Sheboygan:

I had the privilege of seeing Dr. Rodolf's clinic, and I think he clearly demonstrated that the band was useless, before all of us that saw his demonstration. The argument usually is that the pin is a lever. If you will just look at the principle of it you will find that the pin is not a lever. You will find that the pin is in the relation of the weight on the lever. The tip of the crown is where the power is applied ,and the labial junction between the root and the crown will be the fulcrum, and the pin will act as the weight instead of a lever. As long as you have no stretching of that pin you can absolutely have no leverage of the pin. That is where the platinum pin is again useless, because it will stretch. Some softer metal is much better.

Dr. R. E. Maercklein:

If the band is accurately fitted around the root there is no question but what it will prevent the root from splitting. You will find also that if you look at the Logan crown the platinum pin in those baked crowns—if those crowns are set with the pins as they originally come from the depot—I think there is little danger of those pins stretching or giving way. Whenever you find anything like that I think you find that the pins are either filed down or cut down so that they are weak. But if the pins are left in those Logan crowns about as you get them from the dental depot, and set as they are, I think there is very little danger of having those pins give out. At least all I have seen that did give out were where the pins were filed down to too small dimensions to support the crown.

Dr. B. G. Maercklein:

I had not intended to speak on the subject, but I desire to answer the question of the gentleman as to how long will a Richmond crown last without the use of the pin. I can give some authoritative answer on that subject. I assisted Dr. Richmond in putting on ten crowns in the mouth of the late Dr. Miner, of Milwaukee. I assisted Dr. Richmond in order to learn the process. The work was done in Dr. Miner's own house and office. They were put on in the year 1878, and Dr. Miner took nine of those crowns into the grave with him about three years ago. Anybody who is good at figures can figure how long those lasted. The six upper front teeth were worn down almost level with the gum. Those were made without pins, every one of them.

Dr. T. A. Hardgrove:

They all seem to be of the opinion that in order to have a post you have got to use the same kind of material used in the Logan crown. The material of the Logan crown is virgin platinum. When you use the Richmond crown you use the platinum alloy, which is much stiffer, and does not stretch. If the post material does not stretch the band is an advantage. It must be, because it supplies part of the resistance to the displacement of the crown, or the fracture of the root.

Dr. Raymond Wenker:

I am not much in favor of a crown without a band. Only yesterday I extracted the root of a tooth that had been crowned with a porcelain crown that I planned on removing and putting on a Richmond crown, because it was a lower incisor root, which is naturally a slender root, and very weak. I warned the patient that we better take that crown off and have a banded crown put on; but my warning was too late, because when we met the appointment to put on the crown we found the root split, and I removed it. That has been my experience in many other cases, even where there was so strong a root as the upper central incisor, and in patients whose teeth were large and strong. I think where porcelain crowns are indicated—porcelain without a band—are where there is but little strain on the crown; and where it is very important to have a perfect match in color, on account of the marked translucency of the teeth. The shorter the crown the less strain there is on the root, and the less danger of cracking. The longer the crown the greater strain on the root, provided the occlusal habit were equal in all patients.

I would naturally stake my reputation on the banded crown in preference to the bandless, every time; but for appearance I believe we can match more perfectly with a full porcelain crown than we can with the Richmond.

Dr. C. G. Reinfreid:

I find that where irritation is produced it is because the band is made too long. As regards the metal showing, I think I can grind the facing to thoroughly cover the metal. I make the labial portion of the band very narrow, probably a thirty-second of an inch. That is where the irritation mostly comes in.

Dr. U. M. Richardson:

It is quite natural that a paper advocating a method of procedure somewhat at variance with the views and practices of a large part of the profession should meet with opposition, so I am not surprised at the opinions expressed. It is all in the root preparation. Some operators cut the root square across and some cut it round; they have no regard for the bite at all. I use for a post the S. S. White post that comes from their Logan crown. I use it because in case of breakage I can get my post out without splitting the root.

Porcelain crowns without a band, when properly fitted to the root, in most cases give permanent service, as you all have observed in clinical experience. It is no unusual thing to see some of these crowns fitted as long as twenty or thirty years ago still giving good service in the mouths of patients, and with the gum tissues about them in practically normal condition. A great many advocate the practice of placing a narrow band beneath the free margin of the gum as a means of carrying the immediate joint between the crown and the root to a point less accessible to the penetration of secretions. This joint is made in close approximation to the peridental membrane, and has as much protection from oral secretion as does a gingival margin of a band occupying the same relative position. It is my belief that it is impossible for even the most expert operator to so fit a band underneath the gum margin that it will make a smooth joint with the root and reproduce the natural outline of the original tooth and root; and in every such case there will be more or less irritation made manifest sooner or later. We all know that porcelain is more harmonious to the gum than gold or platinum; hence porcelain alone should be used to reproduce the crown of the tooth.

ODONTOLOGICAL SOCIETY OF CHICAGO.

A regular meeting was held October 10th, with the president, Dr. J. H. Woolley, in the chair.

Dr. W. V.-B. Ames read a paper on "A Feature of Pyorrhea Treatment."

DISCUSSION.

Dr. E. R. Carpenter:

In view of the fact that I do not feel capable of discussing the medical side of the subject I will, if permitted, touch upon a few other things in connection with the subject of pyorrhea.

I think that surgical rest is one of the all important beginnings in the treatment of pyorrhea. This is gained in several ways, according to the conditions. In the first place, where two teeth occlude, abnormally, the exhibition of the disease is purely mechanical. I relieved a case of that sort this afternoon by grinding off the cusp and relieving the abnormal occlusion. In many of these cases I have found it necessary to devitalize the pulp before curing a condition which refused to respond to medication, scaling, and that kind of treatment.

In connection with the essayist's remark on fixed bridges I think the dentist does himself a great deal of harm, as well as an injustice, in not explaining to his patient that he is doing something the permanence of which he can not tell, but something which will be a great deal better than putting in a partial denture.

I wish to refer to something that was suggested to me by Dr. Fernandez, which is the use of compressed air for medication, and introducing medicaments into pyorrhea pockets. Dr. Fernandez suggests getting the regular atomizer tube, such as throat specialists use, and putting into the end of the cap that screws off a little point made by Parke, Davis & Co. The only objection I have to it is that it is steel. It is very good to use in scaling and washing out the pockets with a solution of peppermint water, or something of that kind, forcing every bit of granular substance out of the bottom of the pocket.

I find another use for compressed air in pyorrhea work, and that is by using a compress, such as suggested by Dr. MaWhinney, of sterilized gauze, saturated with pheno-sulphonic acid; after having thoroughly opened up the pocket, I have my assistant stand on one side when I am scaling the teeth and with a light or heavy stream keep the pocket open all the time, so that I am able to see.

Dr. Ames spoke of the use of oxyphosphate of copper, as suggested by myself some time ago, being flooded down in the bifurcation of the roots after having thoroughly removed all deposit, and sterilized as thoroughly as possible. I have done that in several cases, and in some cases have added a band to hold two or more teeth together.

Dr. Truman W. Brophy:

There is no use in attempting to cure a condition such as the so-called pyorrhea alveolaris when the teeth are loose and moving back and forth. The first step to take is to fix the teeth, hold them steady, and carry out the old principle in surgery, which is, when a part is in an abnormal state put it at rest. Before attempting to operate on the teeth the dentist should construct splints and fit them, after which he may remove any foreign substances, and proceed in an intelligent way to arrest the destructive processes.

I am not one of those who hold that this disease is such a mysterious condition, and one difficult to cure. If there is sufficient bony substance to support the teeth I think this condition may be cured as well as any other disease.

Dr. Ames' plan of injecting paste of antiseptic properties into these pus pockets is a good one, and I think where the pockets extend down along the alveolar process the most successful way to eradicate them is to make incisions into them. I had a case today of a robust man, who had a pocket back of the cuspid tooth, far up. I opened it wide, and cleaned it out, and packed it the same as I would pack one anywhere else, with a little gauze. When he comes the next time I am going to use some adrenalin chloride to stop the hemorrhage, and take a little curette and scrape out the bone which is denuded. The case will undoubtedly get well. There would be no use injecting solutions into the neck of his tooth so long as that pocket is so far up.

When Dr. Riggs wrote on this subject first he proposed to remove carious bone around the alveolar process by small curettes, and what he proposed to do then we must do now to a certain extent. Medicine will not remove the diseased bone. Sulphuric acid, if used long enough, will stimulate the healthy area beyond the carious bone, so that it will by and by expel the part which has lost its vitality, but after all the instrument will do it much quicker, and with less discomfort to the patient. I have often questioned the use of the milk of magnesia. We know very well that pathogenic bacteria that have to do with the destruction of teeth thrive best in an alkaline or neutral medium. The most successful method I have used in the treatment of pyorrhea alveolaris has been by the use of acids, and I think there is no acid more potent than the aromatic sulphuric acid, which might in some cases be increased by the addition of a little sulphuric acid of commerce. This is a weak solution, it is true, only thirteen and one-half per cent of the sulphuric acid of commerce, with a little ginger and cinnamon, but when reduced to about twenty-five per cent (adding to about one part of the acid three of water), and with a suitably formed syringe, carrying the preparation around the tooth, we can see the parts improve rapidly. You may use the chloride of aluminum, if you please, but after all it is the chlorine that does the work. This is purely an infectious disease, and the remedies employed in infection anywhere will apply here. The paste that Dr. Ames suggested if applied to an abscess in any other part of the body would be as potent as in this location. We have in this disease analagous conditions, that must be treated in the same way, the bone exposed and scraped and kept clean until the part is in a normal condition.

Dr. Ames has gone very deeply into the matter, and what he has given us has been based not only on sound general propositions, but he has given us results of his clinical experience, which counts for a great deal, in my opinion, in reaching a conclusion in the management of any disease.

Dr. C. N. Johnson:

Every new idea connected with this disease is worthy of attention and consideration. I have been impressed with the fact that the surgical treatment is most important in dealing with pyorrhea pockets, coupled, of course, with holding the teeth firm, as has been mentioned by the essayist. It seems to me that by placing a paste in a pocket, with the expectation of keeping it there any length of time, we may prevent nature from doing what nature would otherwise do if we simply made a surgical operation, with an application of stimulants at that particular time. My experience with this disease is that the more thorough I make the surgical operation and the nearer I keep to the line of having those tissues stimulated by natural processes, the better results I have obtained. If I can hold the teeth firm, and put the parts to work I am able to get better results than by depending on protracted medication.

Dr. George W. Cook:

Three or four months ago Dr. Ames came to my office and brought a tube of paste, suggesting to me the possibilities of its use, and asking me to try it. I must say that I have not tried this paste in a way that would enable me to say anything of special benefit upon the subject. A few days ago I mentioned the fact that he was down to read a paper, and asked him what he was going to give, and he said then that it would be this treatment. He asked me to look up some of the literature on zinc poisoning, if I had an opportunity, as that might be an objectionable feature to the use of the agent. I was under the impression that he referred to a zinc oxide, but his paper states a zinc hydrate.

I might say in connection with this subject that a couple of years ago I did some work in the pharmacological laboratory of the Chicago University, in which we took up the use of many of the so-called heavy metals, and their action on the human body. I was especially interested in some phases of their action on the tissues locally. According to the literature, as well as experimental work, there is but little difference apparently in the actions of metals when they are combined in any of their forms. The best authorities say there is no difference in the action of zinc and copper on tissues except that in some instance perhaps, locally applied, zinc is more irritating and copper more stimulating. Some authorities have reported poisoning by those metals having attracted their attention in the most obscure manner. In European countries they are very cautious. One case is reported in which a man had handled three bars of metallic zinc a day for thirty days, with gloves, and with his face, mouth and nose covered, and this man was taken out of the work because of symptoms of zinc poisoning. It is said that those metals will not under ordinary circumstances poison as a metal, but there must be direct contact, or they must be in a compound in which they can become disassociated. In other words, after the agent is introduced into the tissues or into the body in any way it must be broken up at once, forming an albuminoid of the metal. We have heard a great deal said about the so-called albuminoidal substances in the treatment of local diseases, and that they are efficacious because of their combination. They are more easily assimilated when combined in that way, and penetrate the tissues more deeply, perhaps, than in any other form. The albuminoid substances do little good under ordinary circumstances.

There has been a good deal said with reference to the treatment of disease with those substances, and they are probably some of the oldest remedies that we know of, which have been used as chemical compounds of drugs. They are at times taken up and extensively discussed and laid aside because of their inefficient effect, and more especially because they have no real effect, inasmuch as they become disassociated, and when they become disassociated they immediately combine with some albuminoid substances of the body, forming chemical compounds that are poisonous to the blood, because they combine with the hemoglobin of the blood, and have been called by Cobert hemolin, a compound found in the blood of persons poisoned. Their use has been principally in the form of antiseptics. Their antiseptic properties are due to the fact that they liberate a substance in the tissues that destroys the bacteria, the metal being liberated by combining with the hemoglobin, and being carried off in that way. The action would be that of simply introducing a substance in a part, and by a stimulating effect it would increase the amount of blood to the part, and the disassociation of that compound would produce this condition of combination, be carried away, and would probably do no more good than if introduced in some other form.

The paste, I think, as Dr. Johnson has stated, may retard nature's process there. We would estimate that we might put one-tenth of a cubic centimeter of zinc in a pocket, and the zinc would probably disappear in the ratio in which it combines with hemoglobin, in twenty to thirty minutes. In discussing this question with Dr. Matthis last night he said that he had rubbed the oxides and the various compounds of zinc on the mucous membrane of rabbits, and in the course of twenty minutes he could not get any trace of zinc, but on drawing blood from the animal he could find the so-called zinc hemolin in the blood within thirty to forty minutes. The observance of it is very rapid in any combination in which we might hope to do any good.

I was glad to hear Dr. Brophy mention the fact of the typically infectious conditions of pyorrhea. I have discussed this subject many times, based thoroughly upon experiments, that pyorrhea is a local condition, but there are many phases of bodily constitution that enter into it that we are not at all familiar with. We can get the most excellent results from simple surgical treatment in some cases. In other cases all the care that you can possible give to the patient, and the patient's teeth, will not be productive of good results. The results are slow and discouraging, extremely so to the younger men. If I were to tell you that in the last twelve months I had received over four hundred letters from young men out in the country, wanting help in the treatment of pyorrhea, I believe I would not exaggerate it. I try my best to encourage them in the work, because I believe it is something that every young man needs encouragement in. There is nothing that seems to baffle a young man more than pyorrhea. It is encouragement that the profession needs, and the discussions that we have here will be of great benefit to the profession in the future.

Dr. Ames' suggestions are valuable ones in that they have brought up this subject in a new phase. The question of introducing this material into the pocket has brought some potent thoughts to my mind in connection with it, and I believe we get good results from the discussion, even though we never use the remedy. I believe that I have accomplished as much or more with the lactate of zinc in the treatment of pyorrhea as any remedy containing the heavy metals, and I have used them all.

I would like to put a query: Wouldn't hot air be a good thing to inject into pyorrhea pockets? Has anyone any ideas on that subject? Isn't the hot air treatment, as recently introduced by Dr. Beck, of therapeutic value?

Dr. Truman W. Brophy:

I have no doubt but that it would be valuable. In the treatment of empyema of the antrum, after an opening is made large enough to get access to the cavity, and after polypi and other growths are taken away, I find one of the valuable assistants in effecting a cure is to dry the cavity out well with warm air. We get the surface dry, and when we do apply our remedies they penetrate more deeply into the tissues than they otherwise would. We know that the bacteria constantly present sometimes become well imbedded in the substance of the tissues. One of the merits of argyrol is that it will penetrate into the tissues, and go deeper than most of the other preparations, and it will more quickly bring about a normal condition than most any agent with which I am acquainted. I think it is a valuable agent in the pockets.

The point that you make, that it would be advantageous to dry the surface, is certainly a good one, and I do not think any argument could be made to the contrary.

DR. C. S. CASE:

I know very little of the subject from a medicinal standpoint. The paper concedes the fact that the most important part is the thorough removal of the calculus, and then surgical rest.

I have had considerable experience in the treatment of pyorrhea that has produced irregularities, especially of the front teeth, forcing the teeth out of alignment and extruding them more or less. It has seemed to me that the profession in general has not appreciated fully the necessity of making perfect appliances for holding the teeth in position. I have seen many appliances from the hands of skillful dentists, that seemed to me exceedingly bad and made in such a manner that I should think they would do more harm than good. I have been employing a certain retaining appliance for retaining teeth after regulation, and with a slight modification of that appliance for pyorrhea cases, I should think it would be especially applicable, attached near to the incisal edges of the teeth. By using bands as thin as 1/2500 or 1/3000 of an inch they can be perfectly fitted and reinforced in such a way that the appliance can be worn a sufficient length of time to give nature a chance to restore the alveolar surroundings. By this method the teeth are held firmly, and at the same time one would be able to get at the roots of the teeth while the appliance is in place. Some time ago I presented a staple retainer for permanently holding the upper incisors together that were abnormally separated. Since that time Dr. Wassell has suggested a variation in the construction of the appliance, that makes it possible to attach it to at least six of the labial teeth, either upper or lower. Being attached upon the lingual surface, it is not seen from the front. I think it is of sufficient strength to hold the teeth for a long time. The variation Dr. Wassall suggested was to place separate pins in the pits bored in the lingual surfaces of the teeth, and then take an impression with the pins in place, with a view of drawing them out with the impression. This when filled will place the pins in the cast exactly in the relative position they occupied in the mouth; then by uniting the pins with a wire that was shaped to conform somewhat to the surfaces of the teeth and extend over the interproximate gingivae, you would have a retainer that would extend from one tooth to the other, along the lingual surfaces of the teeth. I have used retainers of this character for three and four teeth. It seems to be very good as a retainer for teeth that have been loosened from pyorrhea. It is free from the gum, and gives perfect opportunity for continued treatment, holds the teeth surgically still, and is not conspicuous in any way. The holes should be bored accurately, so as not to enter the pulp or pierce the peripheral wall. I do not believe it is good policy to cover the surface of the enamel at all in these cases, more than necessary. The enamel adjoining the hole should not be injured, and the wire should have a rounded undersurface where it rests against the enamel base.

Dr. L. L. Davis:

I simply voice what the others have said, that proper surgical treatment and rest is about all that is necessary, in my opinion. The less medicaments we have the better.

The paper brought up the subject of forcing paste into the pockets, but that is something I can not say much about before trying it. I think that Dr. Harlan suggested in 1885 some of the iodine preparations to be forced down into the pockets. The main thing is to get off the deposit as far as you can, and keep the parts at rest and clean. We have heard several suggestions from the members here tonight that will be of benefit to us in our work.

I remember several years ago, at one of the national meetings at Cleveland, Dr. Whitslar suggested the use of hot air in the treatment of pus pockets and alveolar abscesses, but I have not used that method.

Dr. J. H. Woolley:

Instead of surgical treatment I have been very successful in the use of sulpho-phenic acid. I have a combination, and I use the 50 per cent and the 25 per cent, according to the condition of the case. I think we may have abscesses independent of the abscesses caused by the tooth pulp, the affection occurring at the end of the root. We may have abscesses in the peridental membrane, occasioned by the infection of the crown of the tooth through into the dental tubules, and I think it is quite important to see that the dental tubules are thoroughly disinfected. I so thoroughly believe in the use of sulpho-phenic acid in the destruction of the abscess at the base of the pockets that I am using exclusively that preparation.

Dr. Ames, closing the discussion:

My reference to magnesium hydrate was merely a matter of illustration of what might be accomplished were an antacid condition desirable in the pyorrhea pocket. By the simile of the magnesium hydrate, as contained in the milk of magnesia, I attempted to lead up to the idea of using zinc hydrate for the purpose of getting that continued, mild astringent and stimulating effect, and the effect also attributed to the zinc salts, of promoting healthy granulations.

I asked Dr. Cook to look up this question of zinc poisoning because clinical experience leads me to think that outside of the application by the dentist, considerable could be accomplished with such a zinc hydrate paste by the patient by means of the brush in controlling the disease, keeping down the tendency to this retrograde metamorphosis of tissue, if you want to call it such, which will take place between the visits of the patient to the dentist, if coming fairly frequently, but in cases where the patient stays away for too long a time I have come to believe that such a film, by becoming lodged between the margin of the gum and tooth for hours afterward, exerting a medicinal influence by the solution of zinc hydrate in the acids which are present or which may develop from bacterial action, would result in lactate of zinc, in all probability. After having performed the surgical work properly, and given surgical rest, if possible, I came to expect a considerable benefit by the patient using once or twice a day such a paste, which would give this continued medicinal effect.

It has been said recently in one of the journals, in a discussion of another subject, that clinical results are misleading. It seems tonight that my clinical observations are not borne out by laboratory experiments. Dr. Cook's friend says that those materials rubbed upon a mucous membrane will disappear in thirty minutes. Clinically, these preparations used in the mouth manifest themselves hours afterward. Experimentally it would all be absorbed by the blood in thirty minutes. Could this have been taken up by the blood and gone through the circulation, secreting in the saliva? It does not seem that that can be the case for the reason that on rinsing the mouth, the zinc salt taste disappears. We do not notice any zinc taste afterward. It might be said on rinsing the mouth in the morning we get rid of an accumulation; so I can not say at present whether I think my clinical observations have been misleading and whether I doubt Professor Matthis' laboratory experiments.

I must say that in view of what seems to be known of the effect upon the alimentary canal of the absorption of enough zinc to be secreted with the saliva in sufficient quantity to give a decided zinc salt taste, that a patient carrying this proportion of zinc in his blood would be very seriously discommoded. I have had no observation of such results. If this zinc salt taste is because of absorption by the blood and secretion with the saliva, then zinc in the system must be less harmful than has been supposed.

THE DENTAL REVIEW.

Devoted to the Advancement of Dental Science.

PUBLISHED MONTHLY.

EDITOR: C. N. JOHNSON, M. A., L. D. S., D. D. S.

Subscription price $1.00 a year including postage, to all parts of the United States and its possessions, Cuba, Canada and Mexico. All other countries $1.75 a year.

EDITORIAL.

OUR NEW COVER.

In designing a new cover for THE DENTAL REVIEW the idea was suggested by Mr. Wilde, of the publishing department, to have printed the names of men most prominent in the development of dentistry, together with their portraits as far as this was practicable. It was thought that in doing this the profession of the present day would have constantly before them a reminder of the pioneers in such a way that due appreciation of their services might not be overlooked. In the rush of modern ideas, and the absorption in present activities we are sometimes prone to forget what has been done for us by those who have gone before, and no effort should be spared to keep alive the memory of the men who wrought so faithfully for dentistry when the profession was sorely in need of their services.

In arranging such a list the chief difficulty was to select the proper names. This problem was solved by appointing two men to make the selection for us, men who have long been identified with dental biography and who have given much study to the history of the development of the profession. These two men are Dr. Charles McManus, of Hartford, Conn., and Dr. William H. Trueman, of Philadelphia, and their cordial coöperation in this matter places THE DENTAL REVIEW under great obligation to them. We feel sure that their efforts in this direction will also be fully appreciated by the profession. A most gratifying feature of their work relates to the fact that in making out a list independently of each other, the two lists were found to agree so very closely that almost no rearrangement was necessary. To enumerate their reasons for the selection of the various names would require too much space, but that they were all valid no one who is familiar with the men can doubt.

We are doubly indebted to Dr. McManus for furnishing us with the portraits, which we believe are the best in existence of the different men—some of whom have passed away so many years that their portraits are really a treasure to the profession. We can only hope that our readers may be pleased with this new feature which marks the inauguration of our twentieth volume.

THE EDITOR'S DESK.

MY SUMMER VACATION.

(Continued from December DENTAL REVIEW.)

IN THE RANCH COUNTRY OF BRITISH COLUMBIA.

I had several objects in stopping over at Ashcroft and going up into the Cariboo District. First, I wanted to visit a relative who owns a couple of ranches about 150 miles up country, and whom I had not seen for thirty years. Next, I wanted to see the country and the people of the country, and last, I did want so much to get away from a railroad into some quiet place where the daily mail could not tag me incessantly from morning till night. I may add that I got all I went for and more, too, and if I live to be older than the kings of Egypt I shall never forget the delights of that trip. It was all so new, so refreshing, so entertaining, so exhilarating, and withal so restful. But to the narrative.

We were met at Ashcroft by the rancher aforesaid, whose only offense is that he was born an uncle of the writer. He had driven down to meet us, and we were to start the next morning for our long wagon trip to the ranch. It is from Ashcroft that every bit of the freight for the entire Cariboo country is taken by pack trains, and freight wagons—this being the nearest railroad station. When it is considered that the freight to some points is as high as three or four cents per pound from Ashcroft, the price of certain commodities in the district is not to be wondered at. It is also from this point that the stage line runs to the various points up country, but we are to have the luxury of a private conveyance and are not obliged to run on schedule time.

When the wagon drove up to the hotel door for us in the morning we were surprised to see a beautiful Studebaker Democrat, with side and end springs, and seats wide enough for three. Of course, it had the inevitable brake. A vehicle in this country without a brake would be like a bucking broncho without the feet. Here we were, 2,000 miles from home and in another country, riding in a carriage from a salesroom a few blocks from my office. Verily the world is growing small.

When we began to climb the mountain north of Ashcroft, and the Bonaparte River in the depths below looked very far away, the Mater, suddenly remembering an injunction made by a friend before leaving home, who knew something of the nature of the road—an injunction to keep on the right side of the wagon, leaned over to the driver and said: "Uncle John, which is the right side of the wagon?" "The top side," he answered, with a swish of the whip. And there never was a truer remark. We were climbing higher and higher up that mountain with the road apparently tacked on to the side and not at all confident that the tacks would hold. It soon got so that I was more comfortable looking up than looking down—with the idea that if we did fall I would rather fall up hill. But that blessed Indian girl of mine was calmly studying the beauties of the Bonaparte canyon below, as unconcerned as if she were sitting on the front porch at home. She evidently thought Uncle John knew what he was doing, and that it wasn't worth while wasting energy getting scared. The Collector was snuggled in between the driver and myself, and as for the Mater she was desperately endeavoring to obey the injunction to keep on the top side of the wagon. But after all, this experience was mere play to what we had later.

We were to drive to Clinton the first night—thirty-three miles—most of it up grade. We had not driven far before we began to see grouse and prairie chicken by the road side, and as for ducks—well, I will tell of them later. About fifteen miles above Ashcroft we saw a private race track beside the road, where one of the ranchers exercised his horses. It was always the unexpected that encountered us in British Columbia. During this drive we got our first near view of an Indian village or rancherie, though we saw many of them later. The cabins are built of logs, some of them very low and squatty, others a trifle more pretentious. These rancheries constitute the winter homes of the Indians and many of them have a church and cemetery. In summer the Indians, for the most part, camp out, either on the ranches where they work or down by the Fraser River, where they lay in their winter supply of salmon. British Columbia is a country of contrasts. We see the lowliest log cabins, even down to the dugout, and we also see the very finest of country residences.

The Maggie mine is situated eighteen miles from Ashcroft, and we turn the horses, on invitation of the miners, down to their camp by the river. Such hospitality as we received throughout British Columbia was, I am sure, never accorded strangers in any clime. Uncle John said he knew it was all on account of our Indian girl, the Mater said she was certain it was because everybody in the whole country knew Uncle John, but I am convinced myself that it was due to the natural big heartedness and generosity of the people of that region. They are the salt of the earth and I am going to have a lot of them down in Chicago some day to repay their hospitality.

Indian Village or "Rancherie," Between Ashcroft and Clinton, British Columbia.

It was Sunday when we were at the mine and there was little doing except to keep the works in order. Mr. Rogers, the mining engineer, had spent a year at Northwestern University, and when he learned that we were from Chicago he pulled the latchstring of the camp, threw away the latch and the camp was ours—Chinamen, cooks and all. We did have a royal good hour or two at this delightful spot by the Bonaparte River. Mr. Reynolds, the manager, and Mr. Rogers took us into the mine. There was a cross tunnel into the mountain side and we lighted candles and followed this to an oblique shaft extending from the mountain top down 165 feet below the tunnel intersection and 280 feet from the crest of the hill. There was a bucket and cable for taking the men down to their work and hoisting ore, and we were offered the courtesy of a trip in the bucket down to the bottom of the shaft. I peeped over and saw a small, twinkling light away some place in the bowels of the earth and excused myself from the trip, but our Indian girl declared that life would never be the same to her afterward if she didn't see the bottom of the Maggie mine. So she climbed into the bucket and Mr. Reynolds stood on the rims; then the engineer at the top was signaled with a wire and away they went. All we could hear was the grating of the bucket on the guides, and the only way we knew they were at the bottom was by the stopping of the cable. There were not more than two or three men working in the lower end of the shaft that day, but the Indian girl saw enough of practical mining to add considerably to her stock of new experiences on the trip. Her eyes were aglow with excitement when she ascended from the bucket, and she declared that she "wouldn't have missed that trip for worlds."

Log Cabin, Cariboo Road, British Columbia.

The engineer, Mr. Davis, who operated the machinery, came from near our old home in Ontario, and we had a jolly dinner party that day at the camp. The Chinamen outdid themselves and spread before us a meal fit for the epicurean gods. By the way, all the cooking in British Columbia—at the mines, in the hotels, and on the ranches—is done by Chinamen, and they are also actively engaged in other industries. It would be a good thing for the coast states if the senseless and altogether barbarous Chinese exclusion act were done away with. The Chinamen are needed to do certain kinds of labor that can not or will not be performed by native Americans, and aside from the ethical injustice of such an act it is unwise from an economic or industrial point of view.

Just as we were about to leave the camp I asked Mr. Rogers if there were any fish in the Bonaparte. "Here," said he, "try it," handing me a rod. "You may not catch any at this time of day," he remarked, but while they were hitching the horses I had landed three trout, which, needless to say, gave me the fishing fever badly.

Main Street, Clinton, British Columbia.

Clinton is a snug little village, with a good hotel and all the edibles of the season on the table, down to ice cream. We left there early next morning for the longest day's drive of the trip. About twenty miles above Clinton we branch off from the main Cariboo road and take the trail that runs to the Alkali Lake region, where one of the ranches is located. Shortly after we strike this trail we come to a lake called Beaver Dam Lake, a body of water of considerable size, and around which there is an artificial embankment three or four feet high, extending the entire circumference. It has always been a puzzle to the settlers to know what formed this embankment. Some have the theory that beavers built it, while others think the

Indians threw it up in early days. Looking at its extent, and estimating the amount of work required to build it, it is very hard to imagine that either agency could have constructed it. In any event it sets one thinking.

During this forenoon's drive we came upon one of the most unique sights we have yet seen. It is a Chinaman's pack train, transporting goods up to the distant mines. For the benefit of those who do not know what a pack train is I will say that it is a band of horses or mules on whose backs are loaded immense packs of freight, sometimes 300 or 400 pounds to the animal. The animals are then turned loose on the trail and driven by a man on horseback who "shoos" them in front of him, much like the housewife drives chickens toward the coop. Each man will have ten or twelve horses under his care. At the head of the procession is the "bell horse"—a horse with a bell dangling from his neck and usually ridden by the cook. The train camps along the way, and the horses are unloaded and turned out for the night to forage their living. It is a strange sight to see one of these trains moving along the trail for the first time. The immense packs piled high upon the horses' sides sway back and forth to the rhythm of the animal's stride, and with thirty or forty of these all swaying differently it produces a grotesque and moving picture. There were thirty-seven packs in the train we saw, which, with the saddle horses, made a band of about forty.

Part of Pack Train Going Up the Cariboo Road, British Columbia.

That afternoon we had a drive of twenty-seven miles, mostly through the timber and with not a house along the way. The ranches up here are not very close together. At Fairview Ranch, Alkali Lake, whither we are bound, there is one neighbor three miles to the north and one five miles to the south, but there is great complaint of crowding in this region and we saw few places up country so thickly settled.

The second night out we stayed at a rancher's home and started the next morning for a twenty-one-mile drive to Fairview. On the way we halted at a soda spring to get a drink. The water was cold, clear and snappy with soda—the purest soda water I ever drank. It was on this drive that we saw our only band of wild horses. We were driving along on the table land of a mountain, far from any habitation, when in the distance we saw a bunch of horses. I remarked that it seemed strange to see horses so far from any ranch, when my uncle, peering carefully at the band, said they were probably wild. As soon as they saw us they scampered away off over the brow of a knoll, leaving nothing but a cloud of dust on the horizon.

The wild horses of British Columbia are proving a serious problem for the ranchers and the government. They roam in bands over the ranges and among the timber and not only eat the feed but destroy much of it by tramping on it. It seems impossible to eradicate them. They become so wild and the territory is so great that it is out of the question to round them up and catch them, and they are more difficult to shoot than a deer.

About noon, as the road begins to curve down the mountain, we get a glimpse of the Fairview buildings, and in another half hour we are in front of the house with grips and parcels tossed on the porch.

(*To be continued.*)

BOOK REVIEWS.

ORTHODONTIA, OR MALPOSITION OF THE HUMAN TEETH, ITS PREVENTION AND REMEDY. By S. H. GUILFORD, A. M., D. D. S., Ph. D., Professor of Operative and Prosthetic Dentistry in the Philadelphia Dental College; author of "Nitrous Oxide," etc. Approved by the National Association of Dental Faculties as a textbook for use in the schools of its representation. Fourth Edition. Pages 220. Press of T. C. Davis & Sons, Philadelphia.

Anything that Professor Guilford writes is well written. The fourth edition of this work is largely made up of matter not appearing in the previous issues, bringing it as nearly as possible to date. New chapters have been added on "Facial Harmony and Occlusal Relation" (a subject that is claiming more and more the attention of orthodontists), "Construction of Appliances," and an "Outline of College Technic Course."

The author gives liberal credit to other writers on this specialty, with the evident aim of presenting the crystallized thought of the most advanced men in the profession on the subject. The illustrations are beautifully made and the text clear and concise.

DOMESTIC CORRESPONDENCE.

NEW YORK LETTER.

The New York Institute of Dental Technique at its regular meeting in November had one of the best meetings it has ever held, and thus far, probably the best for this winter of any society in and around New York.

President Brush called the society to order at a little after 8 p. m. to hear two very fine papers. Without much in the way of preliminaries Dr. T. Ledyard Smith was introduced to read a paper entitled:

FACTORS IN SUCCESS IN DENTISTRY.

The word success may have for each one such a different meaning that a discussion would follow, because our desires and aims would differ.

A man who has studied and toiled and even suffered privation to accomplish something that shall bring him distinction would accept no money were it to obliterate his life's work. A sign marked "This way to success" would convey to no two of us the same meaning except in a general way.

To be a success as a dentist one must be an expert in every department. In addition he must possess the knowledge of a specialist in medicine and surgery; he must have the attainment of the idealist with the practicability of a materialist; he must be a reader of humanity. To be successful the dentist must be more than simply capable—his profession must shine in no uncertain light. He must acquire the methods of the books, not the methods of common life, but those methods that are best suited to carry on the details of the undertaking in question. Wtih all the ability of an expert operator his financial success will ever remain in perspective if his business methods are faulty. The dentist will be a success in proportion to his versatility. It is neglect that gives us our work, that even makes every department so that it can be specialized. This neglect can be assigned to two causes: The fear of pain, and expense. Lack of pride might be added, but this would apply to a class of people no dentist wants. Many persons who do not go to an advertising man read his signs and reason that if he has painless methods we should certainly have them. It spurs us to live up to his claims. To the neglect of the mouth and teeth the physicians as well as the dentists are indebted for much of their work. It is doubtful if any class of persons engaged in one undertaking offers more value for so little remuneration as does the dentist. It would seem as if we receive the least remuneration of all the professions.

As both papers of the evening were along the same lines, Dr. Smith was followed by Dr. F. L. Fossume, whose paper was entitled:

HIGH STANDARDS AND FINANCIAL SUCCESS.

Referring to Benjamin Franklin's adage "Honesty is the best policy," he said it was the highest moral injunction with the basest and the lowest reasons for that conduct. That there is nothing that keeps down the standard of our profession more than self-satisfaction, growing out of self-deception. Said that to be in touch with men who have been through the mill and who tell the story of their failure and up-building, is the surest way to quell one's self-satisfaction and to spur a man on to higher effort. He did not consider high standard as necessary to financial success, but does claim that high standards do bring financial success and that of the most desirable kind.

Referred emphatically to the personality of the dentist as being an element not to be least considered. He then enlarged upon what he considered improved methods in business detail. Said among other things, take all the time necessary, do the work as well as you can and make the charge according to the time it required and the value of your time as gauged by the demand for it.

Among other things he said it is our duty to dignify our profession. It is our duty to see that our financial rewards are forthcoming and they will be if we give the proper amount of attention to business methods.

The discussion was opened by Dr. G. Lenox Curtis, of New York, who said in part that he emphasized the adage "Honesty is the best policy," because it is not only the surest way to secure and retain business, but because it is the only way by which character can be developed. He said that our chief duty in life is to cultivate integrity of character. No one has a right to engage in any business solely for the financial reward that it conveys. Every one has the privilege of choosing the standard he most desires, but by the standard he chooses will he be known and judged. Skill is another test that is necessary to insure professional success. He quoted from Emerson "If a man can write a better book, preach a better sermon or make a better mousetrap than his neighbor, though he build his house in the woods the world will make a beaten path to his door." Incompetence is the bane of the dental profession. To such an extent does this prevail, in his opinion, that no more than 10 per cent of our profession are competent to treat in a proper manner the ordinary cases which daily confront them.

Dr. Curtis was followed by Dr. H. Clay Ferris, of Brooklyn, N. Y., who discussed the matter in a brief but pertinent manner.

He thought it would be of inestimable value if the profession could agree upon some equitable method of making a charge for services. Regarding his own method of practice he said that he and everyone should make a charge for everything done during the entire day's work. If he performed an operation, no matter how small, he made a charge for it. He does not keep a time charge always before his patients, but tries to impress them that time is valuable.

F. L. Stanton said that he found it difficult to understand why a body of intelligent men essential to the public needs should receive so little for their services. Why should not the best dentists receive as much as the top-notchers in medicine and law? He claimed that the cause lies with the dental profession because of its low estimate of itself. Our ideal should be above our power and we should endeavor to realize that standard as closely as we could.

Dr. Brush, the president, vacating the chair temporarily, said among other things, that this was an important phase of professional practice. For a man to become endowed with information as to how his work should be performed but with no idea as to what he should receive in return for such services usually results in a hit or miss, take-what-you-can-get sort of business. He claims that as long as this is the state of affairs we may expect patients to ask, "What do you charge for gold fillings? What? Why, Dr. ——— doesn't charge nearly that much and his fillings stay in!" He asked the question "What do your patients come to you for?" So much gold or silver, or a gold crown, or as they express it to have a "nerve killed"? No, the patient comes for you to help him save his teeth, to do your duty, to determine the road to accomplish this. It is for these services—and for all of them—that one is entitled to reward.

Certain dentists delight to say that they never think of fees, but that is the ideal. He claimed that this was not exactly candid or honest. Disagreed most emphatically with these gentlemen who thought that it was degrading to think or even speak of money in connection with our professional services.

Several others participated in the discussion along the same lines. Drs. Smith and Fossum did not take long in closing the discussion, but seemed to be as well satisfied as the majority present, that the dentist who is conscientious and honest does *not* obtain the reward he should, and that concerted action on our part as well as individual attention to system and detail would be beneficial all around.

The regular meeting in December of the New York Institute of Stomatology is its annual meeting for election of officers.

Dr. S. E. Davenport was elected president in the place of Dr. Chas. Otis Kimball, who has been a very acceptable presiding officer, Dr. J. Morgan Howe continues as treasurer and Dr. Herbert Locke Wheeler as recording secretary. Dr. C. C. Linton was made corresponding secretary. Dr. C. B. Parker, of Brooklyn, was elected a member of the executive committee, and Dr. F. Milton Smith made chairman of the executive committee. The society was reported in a most flattering condition financially, with a list of about 250 members, with many proposals. Altogether the society has much to be congratulated upon.

The First District Dental Society of the State of New York held a two days' session on the 11th and 12th of December, which was almost unparalleled in the East. On Monday the attendance was *good,* but on Tuesday, at the clinics, there was not even standing room. When such men as Dr. Safford G. Perry, Dr. F. Milton Smith, Dr. V. H. Jackson, Dr. E. A. Bogue, Dr. A. W. Harlan and many others leave an active, pressing practice to demonstrate at a public clinic their special methods in certain directions, there is surely "something doin'." The dental profession in and around New York must have thought so, if the size of the crowd is to be taken as any guide, and certainly these gentlemen who so generously give up their time and leave a strenuous practice for virtually two days, deserve to have a goodly company attend their efforts.

Dr. Safford G. Perry, in his pleasant, attractive way, seated at a small table, demonstrated the use of his hand matrices, his combined separator and matrix, and his right angle mechanical mallet attachment.

At another table Dr. F. Milton Smith demonstrated a method of filling a cavity partially with non-cohesive gold and finishing with cohesive; also a method of using metal (silver?) in filling root canals.

In a small room, all by himself, one of our experts in electric therapy, Dr. Sinclair Tousey, demonstrated the x-ray and high frequency currents and showed the dental fluoroscope, the film carrier, and indicator for dental radiography.

Dr. Karl Smith showed among other things a unique method of securing a groove in any inlay, no matter how small. He makes a ring of very fine copper wire and places it in the matrix. When the inlay is finished the wire is dissolved out with nitric acid, and behold, the groove.

Dr. A. W. Harlan demonstrated a very simple method of sterilizing water, instruments, linen, etc., and exhibited new apparatus for this purpose, all of which consists of copper.

The linen sterilizer is a copper box with an electric heater at its base; there are racks for trays, towels, etc. The apparatus for sterilizing water is a copper pot, kept always bright; water becomes sterile by contact with the kettle by the colloidal action in less than four hours.

At a near table was seated Dr. J. E. Nyman, of Chicago, who continued to explain uninterruptedly both afternoons the system of "gold inlays" as fillings which are adaptable too as abutments for bridges. His was an excellent clinic and those who could not get near enough to him missed probably the best thing of its kind presented to us these days.

Drs. V. H. Jackson, R. Ottolengui, E. A. Bogue, Rolf B. Stanley and others, at their respective tables, enlightened us on the various methods of orthodontia.

Dr. M. R. Brinkman demonstrated an exceedingly simple method of repairing broken facings on crowns and bridges.

Dr. C. S. Hardy, of Summit, N. J., demonstrated the use of Ascher's artificial enamel, of which he is an enthusiastic advocate, operating upon the patient.

Pyorrhea alveolaris, surgical operations and treatment, were performed and shown by Dr. G. Lenox Curtis, of New York, and Dr. R. G. Hutchinson, of Brooklyn, while Dr. J. W. Dousley, of Boston, presented a method of retaining loose teeth by ligatures and plastic mixture.

Dr. Schamberg, of Philadelphia, surgically removed an impacted third molar, as did Dr. J. F. Hasbroeck.

Dr. John H. Meyer, of this city, reduced a fracture of the inferior maxilla with his "fracture reducer," a case having been secured for the purpose.

There were other surgical clinics, which made of this probably the best surgical dental meeting ever held in New York.

There were fifty clinics in all on the program, and it is safe to say that not more than two failed to appear.

The exhibits formed a larger feature of the occasion than at any previous meeting; there was apparently no end to them. All in all the clinic committee are to be congratulated for the remarkably successful gathering they brought for our edification.

At the end of the second day the large amphitheater in the Academy of Medicine was crowded long before eight o'clock to hear another essayist from the West, Dr. J. P. Buckley, of Chicago, read a paper, the subject of which was "The Rational Treatment of Putrescent Pulps and Their Sequelæ."

The president of the society, Dr. Arthur Swift, after announcing the suspension of the regular business, introduced Dr. Buckley.

His paper was accepted as deducing a logical, rational elucidation of pulp treatment. It treated of the chemistry involved in the decomposition of the pulp tissue, similar to his paper before the New York State Society in May last, relating to the discoloration problem.

The doctor seemed to think that dentistry is a separate and distinct profession. He asked the question, "With all our pride in the progress of dentistry generally, can we really be proud of the progress made in dental therapeutics?" "I feel that in our anxiety to develop certain branches, this branch has not received the attention it merits. This was not true, to the same extent, in the earlier history of our profession."

The treatment of putrescent pulps Dr. Buckley thinks, in the past has been almost empirical, the reason for which he ascribes to the lack of interest shown by the profession in chemistry and incidentally in the chemistry of pulp decomposition.

He said that drugs were generally selected and used because of their ability to inhibit the growth and destroy the vitality of micro-organisms; absolutely ignoring the fact that there were other things, such as irritating gases and poisonous ptomaines which it was necessary to destroy. He asked his listeners to remember that the chief constituent of all living tissue is proteid bodies. The putrefaction of these compounds if forced through the apical foramen are capable of producing pathological disturbances.

He then described the changes brought about in the dental pulp (dead) by the pathogenic micro-organism and the selection of drugs to counteract their deleterious influence.

He thinks there has been much needless discussion about the power of coagulating agents because the coagulable substances of the pulp have lost their identity and new compounds with different properties have been formed, so in the selection of drugs he has eliminated the question of coagulants and selected drugs which he knows will unite chemically, converting the products into odorless or non-poisonous compounds, as well as destroying life.

Formalin was selected as one of the drugs because of its power to destroy sulphurreted hydrogen, producing methyl alcohol and sulphur and uniting with some ptomaines, changing the irritating gases and poisonous liquids into non-irritating and non-poisonous substances.

Cresol is the second ingredient of his prescription which is used to dilute formalin, the latter drug being considered too powerful to use alone and also because cresol has the property of dissolving fats which are produced by the decomposition of the proteids.

This dressing of equal parts of cresol and formalin is then sealed, hermetically, in the affected tooth, which can remain for several days or a week, after which it is removed, the canals cleansed and washed with one-five-hundredth of bichlorate of mercury in hydrogen dioxide, the canals then dehydrated with alcohol and warm air and a modified formula of two parts of cresol to one of formalin, again sealed in canals. After this all that is necessary to establish positive asepsis is to properly fill the canals.

In the treatment of those cases of pericementitis and those accompanied by developing abscess it is often necessary to assist nature in aborting an abscess. For this purpose he prescribes potassium iodide and syrup of sarsaparilla, one part and six parts, in water, after meals or oftener, and probably citrate of magnesia would be indicated. Quinine bisulphate is a good remedy in some of these cases. Where there is considerable pain six grains acetanilin powders may be necessary.

For the treatment of chronic alveolar abscess Dr. Buckley recommends prescription No. 2. Dry the canals (after evacuating pus) as thoroughly as possible with alcohol, then seal the remedy on cotton hermetically as described. Unless there be some complication the pus formation is checked in one or two treatments. After pus has been checked do not disturb the tooth for a week or two, so as to allow nature to restore.

In those cases where a weeping of serum continues from the canals, use eucyptol and thymol one part to ten, respectively.

The use of hydrogen dioxide in washing out a fistula is always unnecessary. For cauterizing a fistulous tract use the phenosulphonic acid on silk or shred of asbestos and unvulcanized rubber as a compress. This will dissolve sharp edges of root or process which may be a source of irritation.

Dr. Buckley answered Dr. Kirk's criticism of his paper of last May, published in the *Cosmos* for November, by saying that he had abandoned the use of sodium dioxide for the treatment of putrescent pulp canals because he knew of a better remedy and only used the sodium dioxide for *bleaching* teeth *after* the roots had been treated and filled. He expressed Dr. Kirk's remarks as unfair to the profession and unjust to him, to question the rationalism of his method without having tried it.

In concluding, Dr. Buckley said he had gone into details because his remedies had been used where contraindicated. One has been sealed in teeth rfom which live pulps have been removed, which is most dangerous practice.

"The method may not be perfect, nor do I claim that it is the only one by which good results can be accomplished; but I do claim that it is practical and is along rational lines, which can not be said of all methods suggested for the treatment of these conditions."

Dr. S. A. Hopkins, of Boston, opened the discussion of Dr. Buckley's paper. He said that pulpless teeth differ so in peculiar attributes that no one method will suffice in their treatment; even the well nigh obsolete method of extraction has a place.

In that class of cases where soreness, cellulitis, etc., and yet no pus, suggesting streptococci invasion, Dr. Buckley may be able to help us; if so, we shall be heartily thankful. The peculiarity of all proteids is that they differ materially in their composition and solubility. They are frequently quite inert. Their condition is brought about by spore-bearing anærobies. Proteid substances are not always poisonous.

Dr. A. W. Harlan said he felt like saying "the king is dead, long live the king." Dr. Buckley is my successor in the Chicago College of Dental Surgery.

"He has presented a method which is entirely original with him. There are some things, though, that I am obliged to notice.

"He says, that if tissues are allowed to decompose something will happen; that they are to change again if formalin is left in the tooth three or four days. The result is urotropin and methyl alcohol. Cresol is also one of the products.

"The chemistry of pulp decomposition has not been thoroughly studied yet. Sometimes our clinical experience disproves all practice.

"Dr. Buckley will not be able to say that his remedies will be able to stop these decompositions. He starts out with two drugs, but by the time you get through with his array on the board the pharmacopeia looks rather bare.

"Another gentleman is credited with the introduction of bichloride of mercury and peroxide of hydrogen, but in 1881 I combined them and spoke of them. There are other substances that one can seal into teeth. (Dr. Harlan undoubtedly meant the monochloracetic acid of which he spoke at the Second District meeting two months ago and of which you printed a report.)

"Still, Dr. Buckley has given us something in tricresol and formalin."

Dr. E. C. Kirk was scheduled to contribute to the discussion. Although he could not be present he sent written remarks—after having perused a copy of the paper—which were read by Dr. W. B. Dunning, part of which "the adaptability of means to an end should be the laws of medicine."

He took exception to the contention made by Dr. Buckley that proteids are forced through apical ends of teeth. Pulp decomposition has no other origin than bacterial infection.

He exposed himself to much criticism by remarking that he does not use Dr. Buckley's method, because he can and does use methods that produce results more desirable. He characterized some of Dr. Buckley's efforts as juggling with rhetoric as to the use of drugs empirically or rationally. There was no wish, he said, to be hypercritical, but the addition of the diluent of cresol is not needed to dissolve fats, nor is the use of the bichloride compound necessary after the use of the other drug.

Dr. J. E. Nyman was requested to contribute to the discussion, which he did in a most rational manner. He acknowledged what most of us feel, that interest had been deflected from things chemical. He tries to obtain the best results from the use of the best remedies, but chemistry has come to play a great part in our theoretical and practical treatment. His practice seems to be to use the rubber dam little, for he said he believes he would be inflicting unnecessary suffering to apply it for opening up pulp chambers, as he allows them to remain open to drain in those cases where it is indicated. The use of paraform and tricresol in pulp chamber in lame teeth has given him excellent results.

Dr. S. G. Perry said of Dr. Kirk's remarks that he would have made a good lawyer, because he presented his case in a lawyer's way.

He believes with the essayist that we must not force "bugs" or chemicals through apical space, but must use such remedies as will quiet conditions.

"At last we are beginning to appreciate the wider and more positive relation of chemistry to the human mouth. Dr. Buckley has shown by his paper tonight that he is well fitted to take up and pursue this kind of work."

Dr. J. I. Hart spoke of the divergence of opinion from the opening of tooth for drainage to the closing immediately after treatment.

Since Dr. Buckley's paper last spring he has been using tricresol with excellent results.

Dr. Buckley, in summing up, said that he does not know whether putrescin, cadaverin and neuridin are the only proteids.

He knows that Dr. Harlan is correct in carrying the theory one step further by saying that urotropin does again decompose.

"In all my prescriptions there is only one drug, the other remedies are vehicles."

He knows by the compounds he has mentioned he can balance the equation.

A hearty vote of thanks was tendered by a rising expression to Dr. Buckley for his efforts in behalf of the society.

An excellent collation followed the adjournment, where the events of the past two days were recounted, amongst much other talk.

The president, Dr. A. L. Swift, and his lieutenants were kept busy receiving congratulations on their successes, entertaining guests, feeding the inner man, and of course looking to the interests of the "regular"—the man who contributes to the footing of the bills.

Yours truly, "THE BOROUGHS."

PRACTICAL HINTS DEPARTMENT.

Edited By G. W. Johnson, D. D. S.

[This department is for busy readers. We want short articles containing practical ideas—the shorter the better. No article must exceed 200 words, unless of exceptional merit. Every dentist has some useful hint that has been of value to him, and if he will only put it in print it may be of equal value to others. That is what this department is for. Due credit will be given for every article sent. Address G. W. Johnson, The Dental Review, 55 State street, Chicago, Ill.]

To Spur Aluminum Base Plates:—Sharpen an old cone socket plugger point to your ideal spurring point, and use either in an automatic, engine or electric mallet.—*H. E. Latcham, Brainerd, Neb.*

Porcelain Crown:—Diatoric teeth make good bicuspid crowns, especially for lowers. Bake a pin into the tooth and it can then be adjusted with or without a band and finished in the usual way.—*Oliver Martin, Ottawa, Canada.*

Sealing Arsenic in Buccal Cavities:—Seal arsenious acid in shallow buccal cavities with wax, melting the surface around the margins with a hot, small spatula. A good preparation of wax for this purpose is made by using beeswax one part and resin sixteen parts.—*Oliver Martin, Ottawa, Canada.*

Form of Cavity for Inlays:—Prepare your cavities so that you get what I term a lapped joint—not that the porcelain laps upon the outside of the tooth in any sense, but that the porcelain entering the cavity forms a lapped joint instead of a butt-ended joint, or so formed that the porcelain enters wedge-shaped into the cavity. —*W. T. Reeves, Chicago.*

Proximal Cavity Preparation:—I am a great advocate of the occlusal step in proximal cavities. From the standpoint of convenience I find it an excellent thing, especially in the distal cavities of the molars; by extending a right angle step we can see into the cavity and be sure of a strong wall. It is difficult to get the anchorage in the buccal and lingual walls sufficiently strong and safe without some danger of tipping.—*Don M. Gallie, Chicago.*

Setting Saddle Bridges with Cement:—I have been compelled to remove a number of bridges, which I set with cement, on account of the excess cement flowing under the saddle, causing irritation to the tissues. I now cover all portions of the bridge where I do not wish the cement to adhere, with gum acacia dissolved in water, and a little oil of cassia mixed with it to prevent it from spoiling. Since adopting that system I' have never had trouble with cement adhering to a crown or bridge.—*Geo. W. Whitefield, Evanston, Ill.*

Dowel for Porcelain Biscuspid Crown:—If you put in a round, tapering dowel, it will come down straight, and the end of the dowel will fill up what is going to be the weakest part of the crown; but if you flatten the end of the dowel on an anvil so that it is dovetailed, you can bend it backward so as to get it into the lingual cusp, placing it where the largest bulk of porcelain will be, thereby greatly adding to the strength of the crown. The crown will be even stronger by adopting this method than if the dowel was cut off short and the pins of the facing soldered to it.—*F. H. Berry, Milwaukee, Wis.*

Faulty Articulation:—A gentleman called recently wearing an aluminum upper set which he said was causing him much trouble. Upon examination I found a fairly good fit in a case of loose flap on the anterior margin of the jaw, but the whole trouble seemed to be faulty occlusion. Upon using the articulating paper the only tooth which occluded with the lower teeth was the first bicuspid on the left side, and at that point the flap was most prominent. Ten minutes grinding afforded relief. There are more failures from faulty articulation than from any other cause.—*L. P. Haskell, Chicago.*

Contraction of Rubber During Vulcanization:—To prevent the vertical contraction of rubber, I fill in all thick parts of the plates with a compound of one part by weight of pulverized aluminum with three parts of red rubber, the latter being softened by chloroform and the former then rubbed into it. This mixture is devoid of both contraction and porosity. I prevent the arael contraction by the use of a very hard setting plaster for investment, which not only sets much harder than plaster of paris, but retains its hardness throughout vulcanization much better.—*Stewart J. Spence, Chattanooga, Tenn.*

Cement Fillings:—A cement filling, oxyphosphate of zinc, placed upon a surface treated with nitrate of silver, will, for some reason, last a great deal longer and be a great deal better mass than the same mass not having the peculiar effect it gets from this film of albuminate of silver. A great many no doubt have seen the effect of nitrate of silver upon a surface which has been infected to a very slight depth. That in time will become a polished black surface and further decay will never result. Now, if in deeper cavities we can make partial preparation and apply nitrate of silver, and have it last longer than otherwise, it is worth knowing. This was brought to my notice by Dr. Eshelman, of Tacoma, Wash., formerly of Chicago.—*W. V.-B. Ames, Chicago.*

Treating Putrescent Pulps in Deciduous Teeth:—Where you are able to place a root filling such as was formerly deemed proper in these cases, put in a dressing of oxpara or perhaps one of the other medicinal agents that contains formaldehyde and you will have inserted something that will act as a preservative, that is easily placed, and that will do away with so much fatigue that little patients experience with long sittings. I not only practice this in many cases of deciduous teeth, but in some cases of first permanent molars. This is not intended for permanent work, but it will preserve the tooth, retain it in the mouth and give the patient the use of it until he has arrived at an age where his reason can be appealed to so that a permanent filling may be inserted as it should be done.—*B. C. Campbell, Lake Geneva, Wis.*

Filling Materials for Cavities in Permanent Teeth of Children:—For all pit and fissure cavities gold or amalgam is best suited, except in unusual cases sometimes growing out of a retarded eruption of the molars, when cement may be conveniently used to tide the case over until the gum tissue has receded from the occlusal surface. When cavities occur very early in the anterior permanent teeth and for physical reason extensive cutting is not possible, cement or gutta percha should be used, as a temporary expedient.

In nearly all other classes of cavities occurring in the anterior permanent teeth of children, when the question of expense need not be considered, I have found porcelain to be the most satisfactory and producing the most permanent results.—*Henry L. Banzhaf, Milwaukee, Wis.*

Treating Putrescent Pulps:—Something should be applied that possesses great penetrative power. All such antiseptics should be applied in such a manner as to permit of gradual absorption into the infected area, solely through capillary attraction with an entire absence of pressure. For this I should recommend the use of formalin, following with an alkali. They in contact with decomposed organic matter will cause a chemical reaction, with quite a noticeable effervescence, leaving the debris in a condition that can be easily washed away. After this careful cleansing, the canal should be thoroughly dehydrated by means of alcohol and a plentiful supply of as warm air as the patient will permit. The mouths of the tubuli are thus opened so that the fibrellæ can be more easily acted upon. The case is now ready for the antiseptic dressing.—*Algy F. Strange, Litchfield, Ill.*

Impression for Porcelain Inlay:—After a cavity is prepared make a mix of cement which can be conveniently handled with the fingers. Moisten the fingers slightly and thoroughly knead the cement mass between the thumb and fingers. This will expel any air bubbles, and thus insure a sharp, clean impression, which would be impossible where the cement has been luted by some foreign substance. Wash the cavity with warm water before introducing the cement, but do not dry it out, as a little moisture is necessary to facilitate the removal of the impression. If the cavity is in the proximal surface a metal matrix should be placed between the teeth, and the cement forced into the cavity from the direction in which it is to be removed. The matrix should then be turned back over the cement and held firmly in place until the cement has set sufficient to permit of its removal. This impression is for use in making a matrix for porcelain inlays.—*C. H. Farrand, La Crosse, Wis.*

Treatment of Cavities Before Filling:—Several years of careful experiment and observation have convinced me that the right quantity of cement mixed to a proper consistency, placed beneath gold foil in the cavity and subjected to a pressure sufficient to weld the gold, will so perfectly seal the dental tubuli that we may entirely prevent the black line of discoloration so prevalent between cohesive gold and the tooth substance when the cavity is unlined. I prepare all cavities the same as I would if no cement were used, not relying in the least measure on the cement anchorage to hold the finished filling in place. I mix the cement to such a consistency that a small particle of it will quite readily drop from a common nerve broach, and with this broach I carry it into the cavity. The reason for using a broach is because the amount that clings to it is so small that I am enabled to carry it to the floor of the cavity without smearing the side walls. In this way a thin film of cement may be spread over the entire dentinal surface and the cavity is then ready for the filling.—*F. S. Trickey, Freeport, Ill.*

MEMORANDA.

MEDICAL CATALOGUE.

W. B. Saunders & Co., medical publishers, of Philadelphia, have just issued an illustrated catalogue of their complete list of publications, which we understand will be sent free upon request.

G. V. BLACK DENTAL CLUB.

The G. V. Black Dental Club, Inc., of St. Paul, Minn., will hold a midwinter clinic in St. Paul, Minn., on February 22-23, 1906.

All practitioners are most cordially invited to be present. An interesting program is being arranged. For further information address R. B. Wilson, Secretary, 107 East Sixth street, St. Paul, Minn.

The next meeting of the American Dental Society of Europe will be held at Berlin, Germany, the 1st, 2d, 3d and 4th of August, 1906. A most cordial invitation is extended to members of the profession to be present. An interesting programme is already assured and it is hoped to make this one of the most interesting and largely attended meetings in the history of the society.

George O. Webster, Hon. Sec'y,
Pariser Platz, I., Berlin, Germany.

DENTAL EXHIBIT.

On March 27, 28, 29, 30, 1906, there will be held at the Auditorium, Chicago, the largest exhibit of dental goods and appliances ever attempted. There will be no papers, but experts in every line will give continuous demonstrations. No admission fees or dues. This is an exhibit by the manufacturers for the dentists and all are invited to be present. Particulars in the advertising pages.

ILLINOIS STATE DENTAL SOCIETY.

All members of this society who are in good standing are entitled to THE DENTAL REVIEW free of cost.

If you don't get it, DON'T SEND IN YOUR SUBSCRIPTION (it will cost you a dollar if you do), just write the secretary at once and he will have it attended to.

ELGIN MAWHINNY, Secretary,
34 Washington street, Chicago, Ill.

OHIO STATE DENTAL SOCIETY.

At the fortieth annual convention the following officers were elected: President, Dr. H. L. Ambler, Cleveland, Ohio; first vice-president, Dr. H. C. Brown, Columbus, Ohio; second vice-president, Dr. C. I. Keely, Hamilton, Ohio; secretary, Dr. F. R. Chapman, Columbus, Ohio; treasurer, Dr. Weston A. Price, Cleveland, Ohio; directors for three years, Dr. L. P. Bethel, Columbus, Ohio, Dr. J. R. Callahan, Cincinnati, Ohio, Dr. Henry Barnes, Cleveland, Ohio, and Dr. W. T. McLean, Cincinnati, Ohio.

ANOTHER NEW JOURNAL.

The first issue of *The Dentists' Magazine* has just appeared. It is published in Cleveland, Ohio, and has a staff of four editors, Drs. W. T. Jackman, George H. Wilson, W. G. Ebersole and Varney E. Barnes. Each has charge of a separate department, Operative Dentistry, Prosthetic Dentistry, Humanitarian Dentistry, and Orthodontia. In such capable hands this journal must surely be a success, and we give it a cordial welcome to our ranks. It is published by the Cogswell Dental Supply Company.

ELEVENTH ANNUAL CLINIC OF THE CHICAGO COLLEGE OF DENTAL SURGERY.

The eleventh annual clinic and reunion of the Chicago College of Dental Surgery will be held at the college building, Chicago, January 17 and 18, 1906. This meeting will be a reunion of the graduates of the college regardless of the fact that they are members of the Alumni. A very excellent program is being arranged, consisting of papers with discussion, clinic and a banquet. Rates on all railroads one-third fare have been arranged for on the certificate plan. Yours very truly, RUDOLPH BECK, *President.*

WISCONSIN STATE BOARD OF DENTAL EXAMINERS.

The next meeting of the Wisconsin State Board of Dental Examiners for examination of candidates for license to practice dentistry in Wisconsin will be held in Milwaukee, January 29, 1906, at the Hotel Pfister.

Application must be made to the secretary fifteen days before examination. The candidate must be a graduate of a reputable dental college, or have been engaged in the reputable practice of dentistry consecutively for four years, or an apprentice to a dentist engaged in the reputable practice of dentistry for five years. For further particulars apply to J. J. Wright, secretary, 1218 Wells building, Milwaukee, Wis.

DEATH OF DR. C. C. CHITTENDEN.

Just as we go to press we learn of the death in Madison, Wis., of Dr. C. C. Chittenden, one of the most prominent members of the profession in the middle West. An extended notice will appear in our next issue.

PATENTS OF INTEREST TO DENTISTS.

802,683. Dental swage. John R. Comins, Syracuse, N. Y.

802,408. Cervix clamp for use in dentistry. Wm. A. Rowe, Gloucester, Mass.

802,711. Rubber dam sheeting. Wm. F. A. Schrader, Brooklyn, N. Y.

802,483. Dental appliance. Bert G. Simmons, New Brunswick, N. J.

803,045. Dentists' cervical clamp. Lisle H. Babcock, Canisteo, N. Y.

803,474. Dental applicator. James W. Dennis, Cincinnati, Ohio.

803,475. Dental applicator. James W. Dennis, Cincinnati, Ohio.

802,989. Dental instrument. Albert P. Johnstone, Anderson, S. C.

803,198. Saliva absorbing roll holder and shield. Richard A. Sprake, Denver, Colo.

803,995. Toothbrush. William S. Davenport, Paris, France.

804,116. Artificial bridgework. Harry B. Gregory, Newberry, Mich.

804,200. Apparatus for the correction of irregular teeth. Varney E. Barnes, Cleveland, Ohio.

804,211. Dental switchboard. Monroe N. Callender, San Francisco, Cal.

804,229. Forceps and the like. Thomas C. Hutchinson, Decorah, Iowa.

Copies of above patents may be obtained for ten cents each by addressing John A. Saul, solicitor of patents, Fendall building, Washington, D. C.

THE

DENTAL REVIEW.

VOL. XX. CHICAGO, FEBRUARY, 1906. NO. 2

ATROPHIED TEETH.*

BY G. V. BLACK, M. D., D. D. S., CHICAGO, ILLINOIS.

ATROPHY OF THE PERMANENT FIRST MOLARS.

(*Continued from January* DENTAL REVIEW.)

Atrophy of the permanent first molars should receive some special consideration because of its greater frequence and because it so generally leads to early and rapid caries beginning in the atrophied portion. The plan of injury does not differ from that in atrophy of the anterior teeth, but the details of the injury are different because of the wide difference in the form of the tooth. The greater frequence of the occurrence of atrophy of these teeth is due to the earlier beginning of calcification. In dissections of the jaws of the fetus at term, I have usually found the calcification of this tooth just begun on the points of the cusps. Sometimes there are only small spiculæ, in other cases a more considerable part of the cusps is calcified, but I have never seen the calcification so advanced at birth that the cusps were united by calcified tissue, and evidently they are not so united until much later. On the other hand, it was only occasionally that the least bit of calcification had occurred on the central incisors. More often calcification does not begin on these until about the end of the first year. Therefore, an illness that brings about serious malnutrition during the first year of the child's life is liable to wreck the occlusal surfaces of the first molars, while all of the others escape injury.

Atrophy of these teeth occurring so early is very characteristic if seen soon after the eruption of the tooth and before further injury has occurred by breaking away the sharp spiculæ representing the malformed cusps or by caries. But it is exceedingly difficult to obtain specimens from which to make illustrations. These spiculæ of cusps will stand much closer together than the cusps of the normal tooth. The whole of the occlusal surface of the tooth is dwarfed, often discolored, and sunken into the tooth crown. (Fig. 29.) All around this the enamel of second formation wells out in the form of a broad collar to the normal size of the tooth crown at or about the base of the normally developed cusps. The whole of the injured area is apt to be rough and pitted, and especially there is apt to be wide open pits and grooves. This condition gives unusual opportunity for the beginning of caries, and it is for this reason particularly that they are so often destroyed very early. In cases occurring a little later, but before the completion of the occlusal surface, the conditions inviting the beginning of caries are equally bad. The cusps will stand further apart, are stronger, but the central part of the occlusal surface and the outer slopes of the cusps are in very bad shape. At a still later date, after the completion of the occlusal surface, the injury appears as a groove around the crown of the tooth and is generally of less consequence.

---

*Read before the Chicago Odontographic Society.

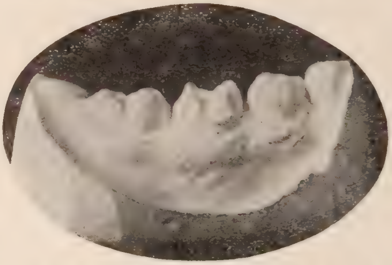


Fig. 29. Photograph of cast showing atrophy of a first molar. Note that the occlusal portion of the tooth is much reduced in size.

In all of these cases the zone of inquiry in the dentin is one of the very grave features, for the reason that caries reaching this zone of interglobular spaces spreads through it quickly. I have found it exceedingly difficult to get material for the illustration of this for the reason that very generally the occlusal surfaces of these teeth are destroyed by caries before their removal, rendering them useless for this purpose. Fig. 30 will, however, give a very correct idea of the form usually taken by this zone of injury. Indeed, the illustration shows two zones of injury, the earlier one of which is very slight. The broader line of interglobular spaces is spread in a sheet over the whole of the occlusal surface, of which this is a section. At the margins all around this sheet of interglobular spaces dips down below the injured enamel tissue precisely as occurs in the incisor or cuspid teeth in their zones of similar injury. This is well shown at the left side of the illustration. The grave significance of this lies in the fact that caries beginning in the imperfections of the occlusal surface quickly reaches this zone of interglobular spaces and spreads rapidly through it, undermining and destroying the whole occlusal portion of the tooth. It often happens that the whole of this has been swept away so quickly that the area is uncovered before decay has proceeded further toward the pulp, fully exposed to the fluids of the mouth, and the progress of the caries is arrested. In this case the tooth remains as a blackened stump that soon rises in its alveolus and occludes with its fellow, which is generally in a

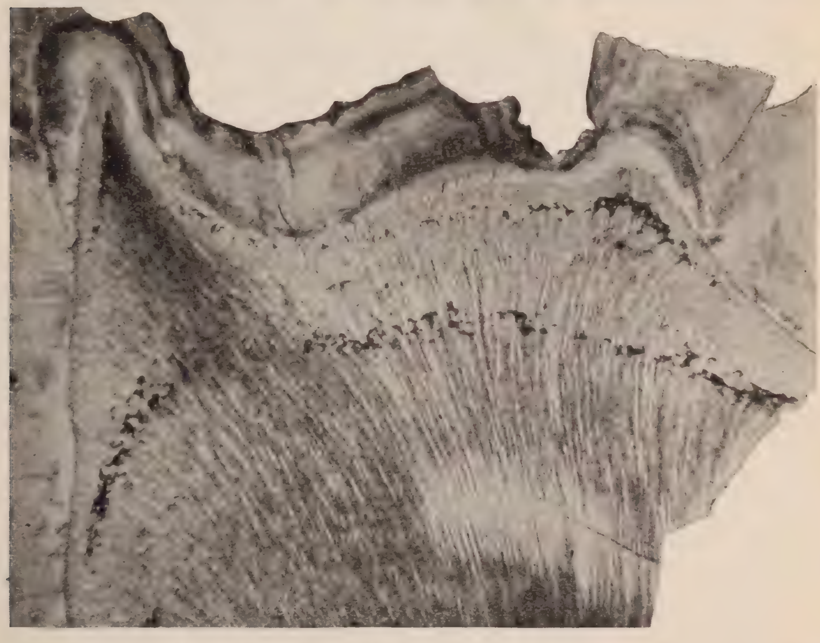


Fig. 30. Microphotograph of a portion of a section from a first molar showing sections of two zones of interglobular spaces in the occlusal portion of the dentine. This is the form of injury to the dentine in atrophy of first molars.

similar condition, and both do good service. More often, however, decay continues in that portion of the zone of injury referred to that dips under the strong enamel around the margins of the crown. Being thus protected, it continues to burrow, finally reaching the pulp and completing the destruction. This is the general fate of atrophied permanent first molars. Case after case comes before me in the great clinic of Northwestern University Dental School in young people in their teens showing atrophy of the anterior teeth. The rule is that the first molars have already been lost. Children from eight to twelve years old are coming often to have these teeth extracted. Such treatment of these as will prevent this result is exceedingly desirable. The treatment is required as early as the eighth year, often in the seventh. A few cases may be successfully filled. A considerable number may be tided along by cementing on a gold cap representing the occlusal surface, extending it over the axial surfaces only enough to give it stability as a temporary expedient. Still other cases may be successfully treated by grinding away all of the injured enamel and thus gaining a smooth surface that will be kept clean by the excursions of food in mastication. This last may often be employed advantageously after considerable decay has occurred. It was not my intention, however, to discuss treatment in this paper further than just this passing suggestion.

PITS IN THE ENAMEL.

Pits in the enamel are a common accompaniment of atrophy of the teeth, but not in any way a necessary part of it, as is shown by the many cases of even the severer injuries in which they are absent. Indeed, in reckoning up the cases coming under my notice, enamel pits seem not to have been present in more than one-fourth of them. Further, these enamel pits occur in teeth that are otherwise normal. It is not very rare to find a single pit in the enamel of some one tooth of an otherwise perfect set of teeth. I was led to study this more closely a few years ago from this circumstance. I asked my senior class to call me to see every case where they found decay beginning on the angles of any tooth. Nearly all of the cases to which my attention was called proved to be pits in the enamel, most of them not decayed at all, and generally a single pit in a single tooth of the set. In exposing such pits by cutting sections, I find the same histological characters as shown by the pits accompanying atrophy.

They mark an imperfection, or partial failure, in the development of the enamel rods, confined to a small area, usually round, and evidently are most apt to occur in cases where there has been some marked difficulty in enamel development, resulting in atrophy. Hence, they are a frequent accompaniment of atrophy. Not infrequently, the rows of pits in the enamel is the only sign left by an illness of injury to the teeth. In this case the rows of pits form zones on the parts of the teeth contemporaneous in development, as one of the expressions of atrophy. When they occur in the absence of atrophy, they may occur in any part of the enamel, showing no especial preference as to teeth or locality on any tooth.

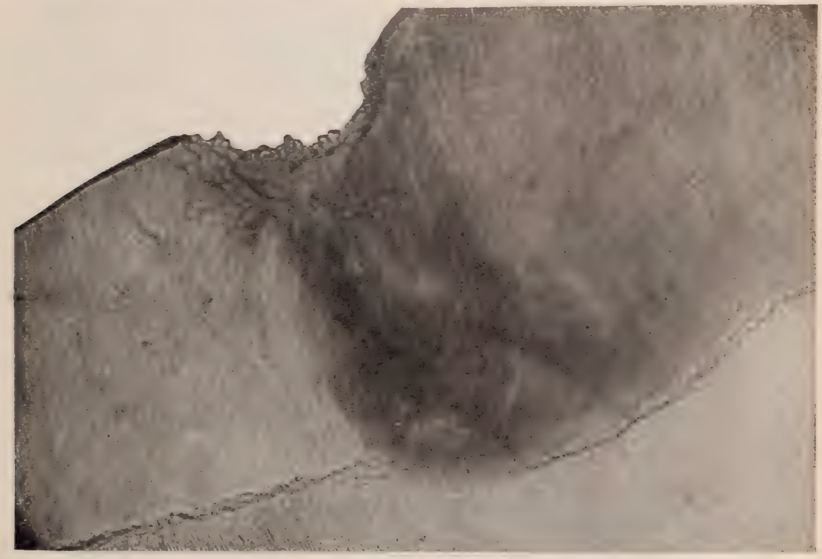


Fig. 31. Microphotograph of a deep pit in the enamel, beginning in a whorl of enamel rods at the dento-enamel junction. Much of the pit is filled with amorphous material.

The pit mark's the failure of development of the enamel rods at a point, leaving a hole of more or less depth. This is generally filled, or partly filled, with an amorphous material, dark in color, varying from a yellowish hue to a deep black. I have never yet made a section of one of these in which the dentine was exposed, though I have seen many that were as deep or deeper than the normal thickness of the enamel. In all of these cases of very deep pits I have found a depression in the dento-enamel junction, as shown in Fig. 31, and a lining of enamel, in which the enamel rods are arranged in a whorl, all pointing to the center like the spokes of a wheel, in the bottom of the pit. When the enamel rods forming these whorls have grown about a certain length, growth ceases, and an opening is left, and this may extend as an open pit to the outer surface of the enamel,

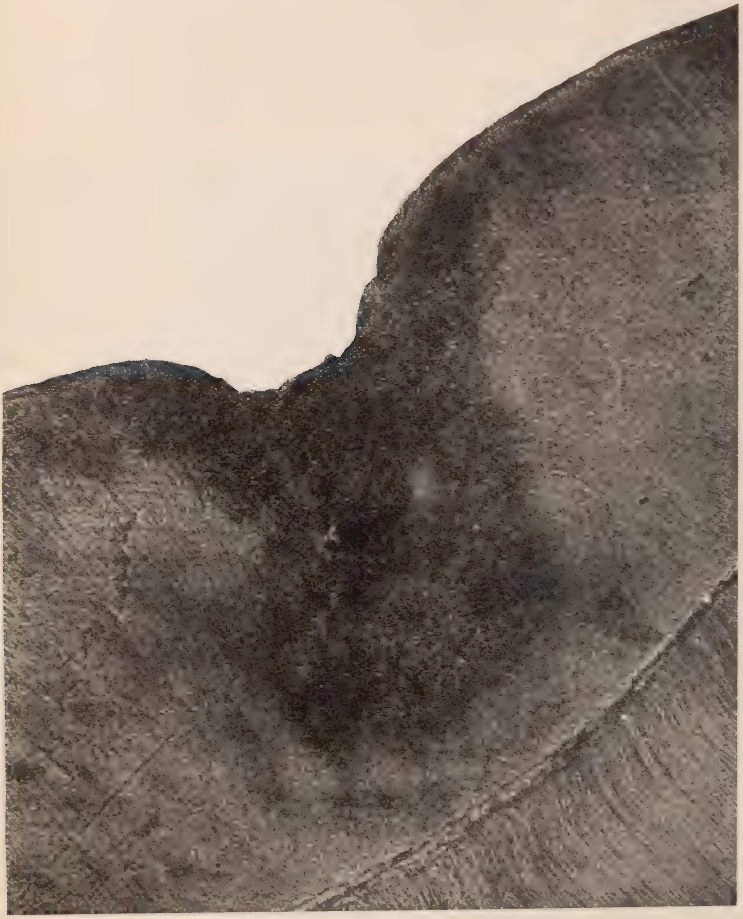


Fig. 32. Microphotograph of a pit in the enamel beginning in the midst of enamel tissues, showing a failure of the development of enamel rods. The pit is nearly filled with amorphous material, very dark in color, and much of the enamel in the neighborhood is discolored.

leaving an opening the full depth. Or this may be filled in part by a dark material not resembling enamel. Or, again, the surrounding enamel rods may close over it, partially obscuring the pit, or completely, so as to form a smooth enamel surface over it. In Callow's case, described later, the deformity consists mostly in numerous examples of these whorls, many of them extending deeply into the dentine. In Fig. 31 the enamel rods close over the whorl of rods imperfectly, but leave a ragged pit in the surface of the enamel. That these whorls are sometimes closed over so as to give a perfect enamel surface, is shown in Fig. 39, from the occlusal surface of a bicuspid from Callow's case. These definite whorls are at the dento-enamel junction, or actually partly within the dentine. But many pits are formed within the usual thickness of the enamel without disturbance of the line of the dento-enamel junction, as shown in Fig. 32. In most of these cases there is much disturbance of the direction of the enamel rods in the immediate neighborhood as the rule. In some there seems to be a failure of the enamel organ to perform its function of rod formation at the particular spot. In and about many of these pits there is deep discoloration. Many times the dark color is confined to the pit itself, which is partially filled with a substance strongly resembling the chittinous covering of insects in appearance and in which no enamel rods can be made out. In other cases the dark color extends broadly in, or among, the enamel rods about the pit.

In these pits the disturbance follows the general direction of the enamel rods in the locality. In this the pit is distinctly different from the other injuries to the enamel in atrophy, for these as uniformly follow the lines of Ritzeus, i. e., the lines of accretion. This is as true of the pits that accompany atrophy as those that occur without atrophy.

I have been unable to form any idea of the pathology concerned in the formation of these pits. Their special prevalence in atrophy cases indicates that they are due to disturbances of nutrition. They consist essentially in a failure in the formation of enamel rods. But such remarkable disturbances as those shown in Callow's case, which I shall describe next, indicate that there may be some other pathological element not yet understood. Histologically, they seem to be a very distinct form of atrophy.

OTHER DEFORMITIES OF THE ENAMEL.

In examining the teeth of many people, other deformities of the enamel than the atrophy and the pits above described are occasionally met. It is desirable that these be distinguished and separated from typical atrophy. Generally, this is easy if we keep the typical forms of atrophy in mind. Atrophy, due to suspension of nutrition, affects certain parts of certain teeth, following the lines of contemporaneous development, and when this is seen in any one tooth, certain parts of certain other teeth are marked and all others have escaped. Therefore, if we find a case in which a certain part of each tooth of the whole set is pitted and rough, or grooved, the injury or deformity not following the lines of contemporaneous development, we have found another condition entirely and should separate it sharply from the form of atrophy above described. How many such cases have been confounded with atrophy in the past that have no histological or causal relation to it can not now be told. That some have, there is no longer room for doubt. I have collected a number of such cases. I shall describe only some of the most notable cases coming under my observation. I shall not try to group these into special kinds of deformities, for the reason that I have not studied a sufficient number to arrive at general conclusions.

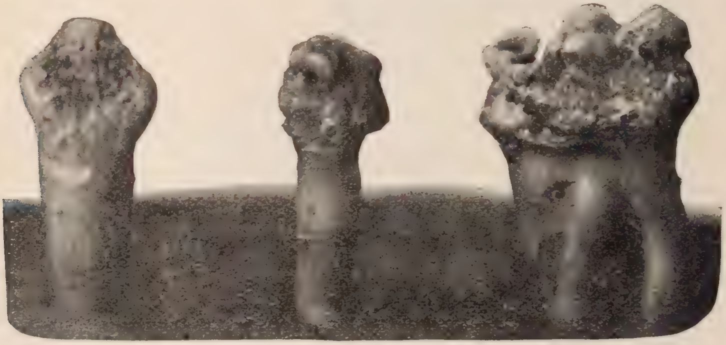


Fig. 33. A cuspid, a bicuspid and a molar from Callow's case. These are fair representatives of the appearance of the other teeth from the same mouth, from several of which sections were cut.

CALLOW'S CASE.

I received from Dr. J. E. Callow, of Antigo, Wis., sixteen teeth removed by him for a young woman who applied to him for treatment. They included incisors, cuspids, bicuspids and molars. The condition of these teeth, as indicated by their outward appearance, is very fairly shown in the photograph (Fig. 33) of a cuspid, bicuspid and molar. All of the others were similar. Examination of these teeth showed that the injury to, or the deformity of, the enamel had no relation to contemporaneous lines of calcification. Histologically, although there were scattered interglobular spaces, there were no markings in the dentine that bore any relation to those that occur in atrophy. Either of these were sufficient to distinguish it as something different from atrophy. In all of the teeth, from incisors to third molars, the deformity was greatest on the axial surfaces and least on the cutting edges and cusps. The surfaces were extremely rough and uneven, presenting sharp spiculæ or knobs and deep pits in the utmost irregularity of form. Over some of the cusps the enamel seemed to be normally thick, but did not have the smooth glazed surface of normal enamel. Only occasionally a small area would show the normal smoothness. In most of the teeth the enamel assumed a normal appearance suddenly near the gingival line and

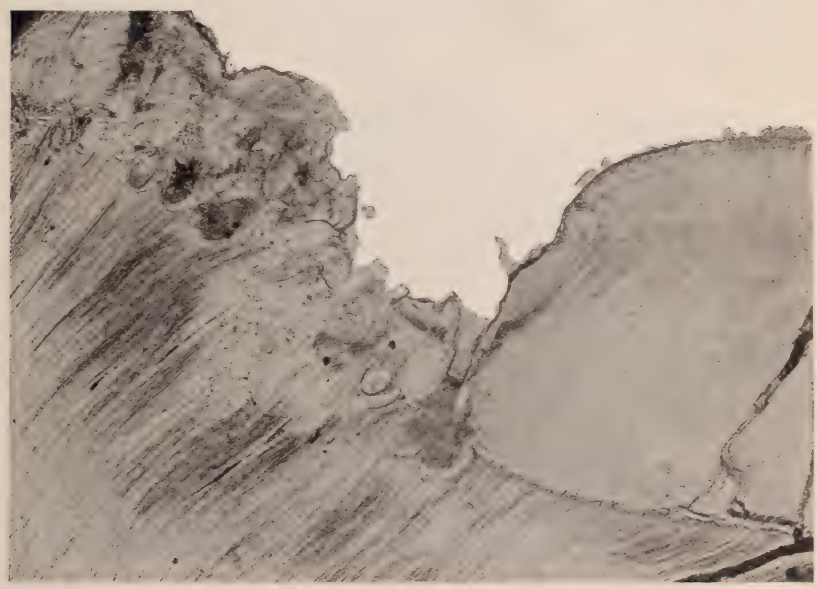


Fig. 34. Portion of buccal enamel from near the buccal cusp of a second molar from Callow's case.

this normal part generally encircled the tooth, joining the cementum in a normal gingival line.

I give in Figs. 34, 35, 36, 37, 38 and 39 illustrations showing the histological characters of the enamel. In most of its parts the dento-enamel-junction is lost in a wild jumble of circular whorls or protrusions of enamel into the dentine. Quite a number of these whorls are hollow and empty, while some are filled with amorphous material, but all of these, without exception, are lined with enamel, usually in the form of the whorls found in the bottom of other enamel pits. In some this lining is very thin. Some of these hollows communicate with the surface by small tube-like openings, forming very deep pits (Figs. 34, 36), while others seemed to be closed on all sides. (Figs. 35, 37, 39.) In occasional patches, even where the enamel began in these whorls along the gingival line, the rods to either side straightened up and closed over them into a fairly well formed enamel, as shown in Fig. 39, from the occlusal surface of a bicuspid. Still, most of the formed enamel is a wild, twisting, curving and bundling of enamel rods. With all of this the enamel formed seemed to be of normal hardness in every part. In a considerable number of places the enamel is plunged deeply into the dentine in long prolongations that were too large and long to permit photographing with any lens

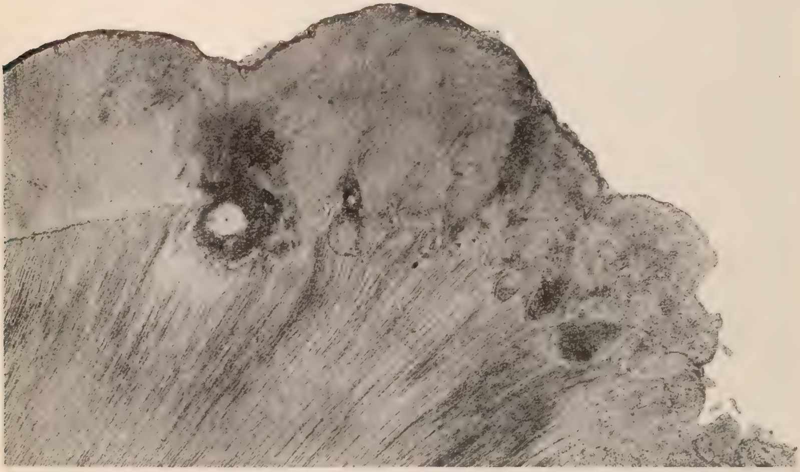


Fig. 35. Portion of buccal enamel from near gingival line on buccal surface of a second molar from Callow's case.

with sufficient amplification to enable the structure to be distinguished. Fig. 40 shows a little part of one of these appearing as an island, midway between the cementum and the pulp canal, considerably rootwise of the gingival line. This is not an actual island of enamel, however, for I traced it as a part of a very long projection from the dento-enamel junction near one of the cusps of the tooth. Fortunately, I used my sectioning machine and had cut these teeth in very thin slices, so that I was able to follow such a growth through several sections. In general, the pictures given show the characters of the departure from the normal very much better than it can be portrayed in words. In this case I could get no indication of any other abnormal condition of the patient. She seems to have been otherwise a normal and healthy girl.

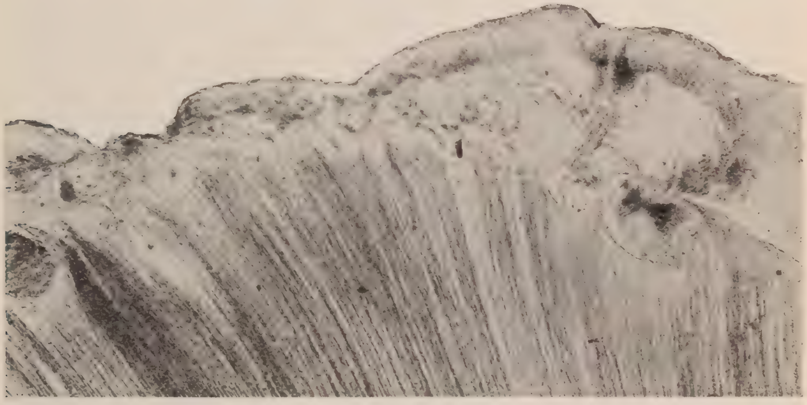


Fig. 36. From a first molar, buccal surface, near the buccal cusp—Callow's case.

Many of the teeth were badly decayed and it is represented that all of them, whether decayed or not, were abnormally sensitive to sweets, heat and cold, and to acid fruits. Also, that this condition of sensitiveness had been persistent since the eruption of the teeth. This sensitiveness was so continuous and severe that it lead finally to the removal of all of the teeth for relief. In all of my observation this unique case stands alone. Considered as a whole, I have studied nothing else like it. I have, however, observed in the mouth a number of cases that may have been of this character. The definiteness of the deformity and the perfectness with which this definite histological character was repeated in each tooth examined indicates that it is a deformity to which the teeth are liable. This is emphasized by the frequent observation of the tendency seen along the line of the dento-enamel junction to form scallops and whorls in teeth otherwise normal. But I know nothing of the conditions leading to this kind of deformity.

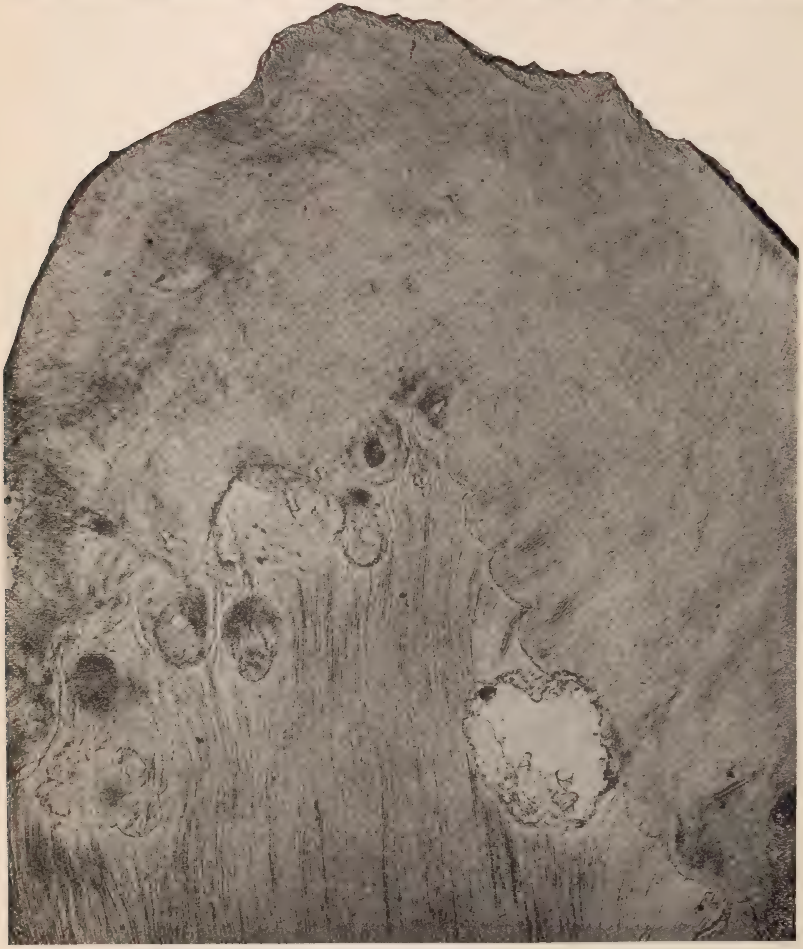


Fig. 37. Buccal cusp of a second bicuspid—Callow's case.

Dr. M. C. Smith, of Lynn, Mass., presented casts of a case at Buffalo at the meeting of the National Dental Association, 1905, which seemed to me to be of the same character. When I examined these models no teeth had been extracted and no opportunity presented for a histological study. Dr. Smith's case presented the same difficulty as to sensitiveness.

Another case was observed in the practice of Dr. J. A. Dunn, of Chicago, which presented a very similar deformity. Yet after careful study of the gross appearances, I believe the case to be atrophy. Every tooth, except the third molars, were badly deformed. Also, the history was of almost continuous illness up to the seventh year. This would account for the normal development of the third molars. Grooves were apparent upon the incisors. But many of the teeth were so badly decayed as to obscure distinguishing marks. As no teeth were extracted, no histological study could be made. The crowns were cut away and artificial crowns placed on the roots. In this case there was a very singular absence of sensation. The teeth could be cut in any way without any pain whatever. No actual exposure of pulps was made in preparing the roots for crowns. Apparently the pulp chambers were completely filled with secondary dentine. In this case, a brother, the father and grandfather are said to have had similar deformities, which would indicate heredity. This might be a mere coincidence. Atrophy is certainly not hereditary.

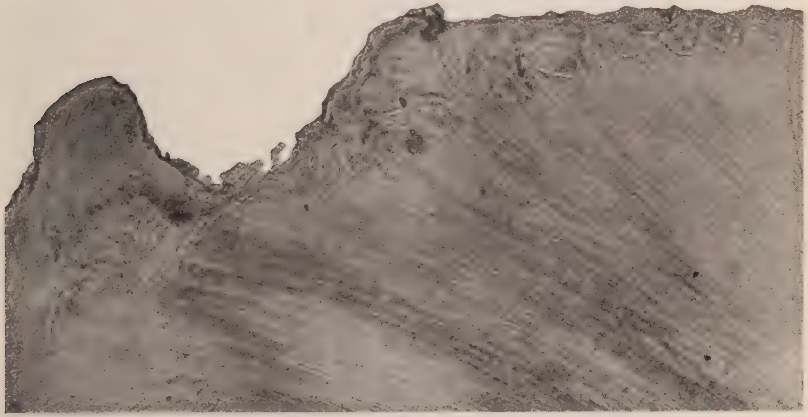


Fig. 38. Distortion of enamel on lingual surface of a bicuspid—Callow's case.

WHITE ENAMEL.

I received fourteen teeth from Dr. D. J. McMillen, of Kansas

City, that had been extracted by Dr. John Prunty, of Boyd, Texas, for one patient, all of which were deformed in what, from macroscopic examination, seemed to me a similar manner to that described in Callow's case. The teeth were very dirty with blood stains and from being handled, which obscured some of their most notable characters. But a closer examination showed the enamel to be soft. I found that I could easily pick the enamel to pieces, and evidently much of it had been lost in this way since the teeth were extracted. All over the axial surfaces there was a series of irregularly formed spiculæ that rendered them extremely rough. Many of these had been broken,

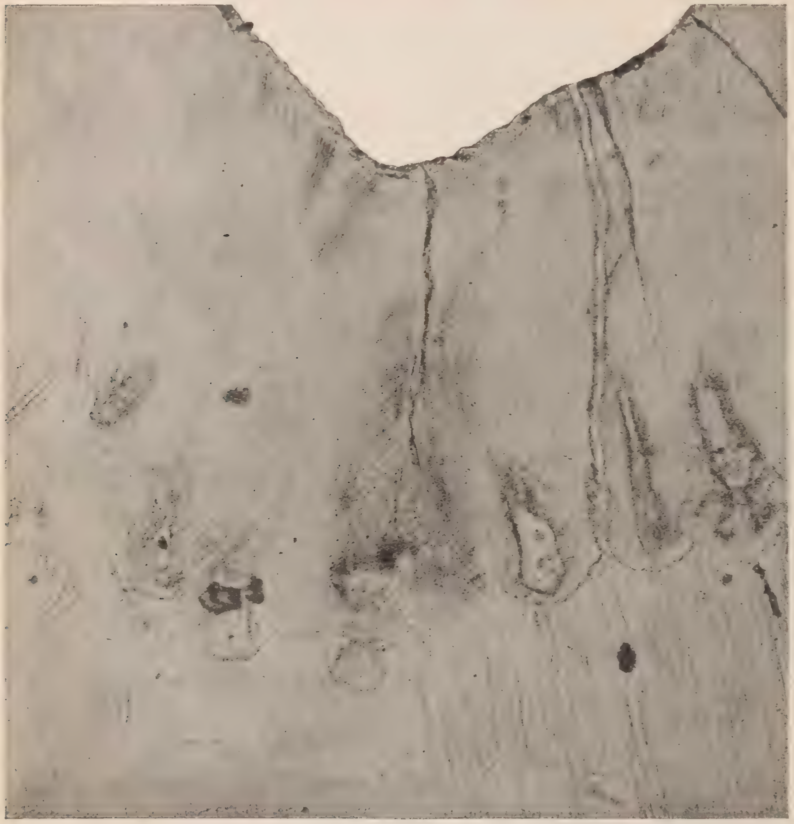


Fig. 39. Open enamel pits closed over, and over which a fairly smooth enamel is formed. Occlusal surface of a bicuspid—Callow's case.

so much so, indeed, that it was with some difficulty that I was able to get sections showing the condition at the time the teeth were extracted.

When I came to the making of sections of these, I found the enamel white through its entire thickness, not the white bluish color of enamel, but the white color of unglazed white paper. The enamel had seemed so frail that I had soaked the teeth in thin balsam and then thoroughly dried them, in order to retain the spiculæ of enamel. Afterward I was sorry that I had not used shellac for this purpose, for in some of my sections these spiculæ floated about in the balsam in which the mount was made as soon as the slight amount of hard balsam left after grinding had dissolved in the softer balsam in which it was mounted. The shellac, which does not dissolve in balsam, would have saved me this chagrin.

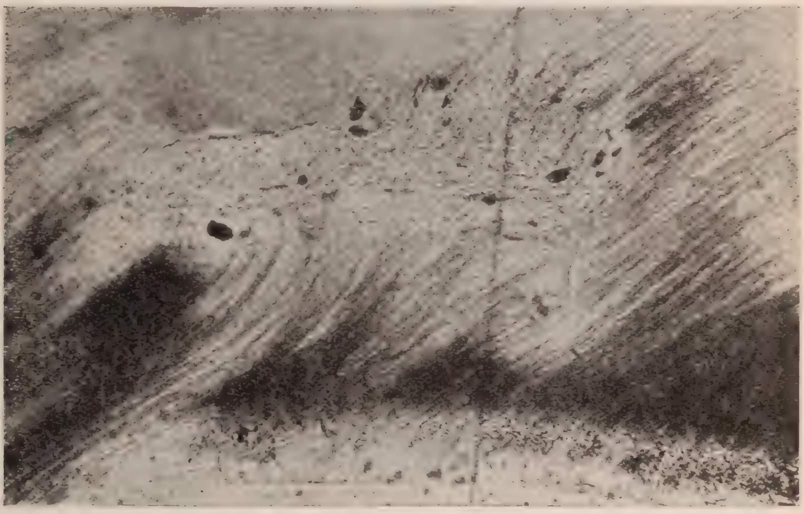


Fig. 40. A bit of enamel appearing in section as an island in the midst of the dentine in a bicuspid from Callow's case.

This case proved to be something entirely different from Callow's case, histologically. The dento-enamel junction was perfectly normal in all its parts. Next to the dento-enamel junction the enamel was in perfect form. But after a slight growth the enamel rods broke up into bundles that became smaller and evidently had ended in spiculæ. I found none of these that had not been broken, though I found patches with the film formed in the mouth still over them after grinding the sections, which showed conclusively that the spiculæ had not been broken after the teeth were extracted. Fig. 41 shows this and indicates very well the manner of the formation of these spiculæ. Evidently the finest of these had been broken after the extraction of the teeth. In many places very little enamel remained.

This enamel throughout all its parts was almost wholly without the cementing substance between the rods. (Fig. 42.) Histologically, this was the principal deformity. I became satisfied from my examination that the rods themselves were fully hard, but they were not cemented together and broke apart with the greatest ease. Indeed, much of the enamel came to pieces after it was mounted and the rods became scattered in the balsam. I have no idea what controlled the formation of the spiculæ which constituted the principal outward deformity. In the mouth the teeth must have had a dead paper-white appearance.

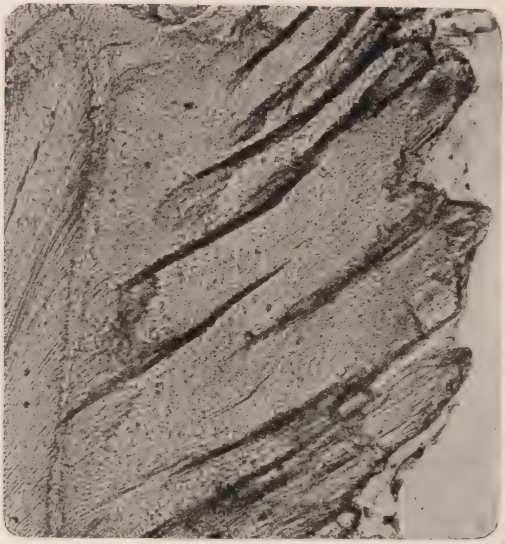


Fig. 41.—Enamel from near the cusps of a tooth in Prunty's case, showing the enamel rods breaking into bundles which end in spiculæ.

I have seen but one other case presenting a similarity to this. A laboring man came into the clinic at Northwestern University Dental School several years ago whose teeth presented this dead paper-white appearance. Every tooth, and every part of every tooth, had this appearance. There was no deformity as to form. The teeth were of usual size, of good contour, and regular in the arch. He said they had always been so and he had been greatly annoyed because of the attention their peculiar color attracted. The man was twenty-eight years old. There were some points on the cusps where the enamel was worn enough to show the dentine, but generally the wear was not excessive. He said he could chew food as well as anybody. There were three small proximal cavities in the bicuspids; otherwise the teeth were sound.

I partially excavated one of the cavities, found the dentine apparently of usual firmness, but the enamel seemed to crumble to pieces easily. Not only the walls of the cavity crumbled, but I could easily push a sharp explorer into the enamel of other teeth anywhere. I took some of the cuttings from the enamel walls of the cavity well beyond the decayed area and distributed them in glycerine under a cover-glass, and with the microscope found well formed enamel rods that looked much like those that had been separated by a very weak acid, or those taken from the whitened enamel in backward decays.

Fig. 42.—A scrap from one of the best parts of enamel found in Prunty's case, showing the rods to be without cementing substance between them.

This condition of the enamel had not rendered the teeth more than ordinarily liable to caries, as was shown by the general soundness of the teeth.

This condition reminded me strongly of the white spots so often seen in the enamel of teeth that are in the main perfectly formed.

(Figs. 43, 44.) The only difference seemed to be that the usual white spots seen are covered with a very perfect glaze, or Naysmith's membrane, so that a sharp instrument will glide over them. This man's teeth had no such glazed surface. A sharp explorer would catch anywhere with very little pressure. The teeth evidently had not a normal Naysmith's membrane. The enamel in the two cases seemed very similar to cutting instruments.

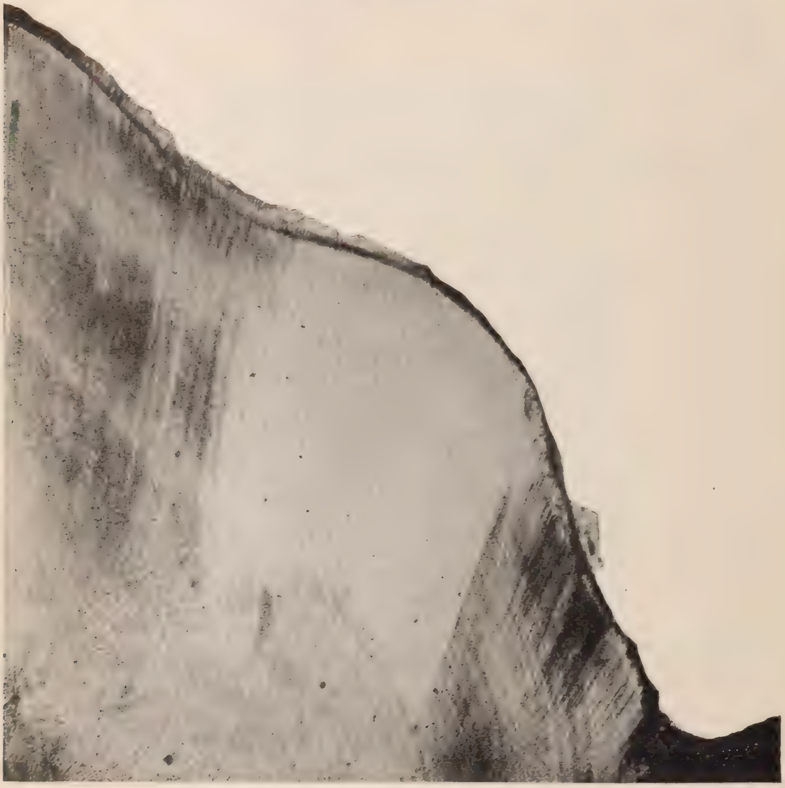


Fig. 43.—White spot in the enamel of an otherwise normal tooth. In the white area the enamel rods have no cementing substance between them.

These cases, taken together with the frequent occurrence of white spots, lead me to the supposition that the failure of the cementing substance between the enamel rods is a special form of atrophy or abnormality in formation to which the enamel is liable. The occurrence of this in isolated spots is not very uncommon, but its occurrence in the whole of the enamel in the teeth of a person is certainly extremely rare. I have seen this in but the two cases mentioned, in the one with abnormal form, in the other with normal form.

Nothing seems to be known of the pathology that brings about this condition.

I regard the study of such cases as of great importance, as it may lead to further knowledge of the formation of this tissue. Certainly the facts developed show that either the functioning tissue or the functioning of the tissue that form the enamel rods is so different from that which forms the cementing substance between the rods that the rods may be formed and the cementing substance fail. Also, we have seen in the illustrations many failures of the enamel rods with the space filled in part with something else apparently without histological form. This something may be the cementing substance that should be only between the enamel rods. According to this view, atrophy of the teeth presents three distinct phases:

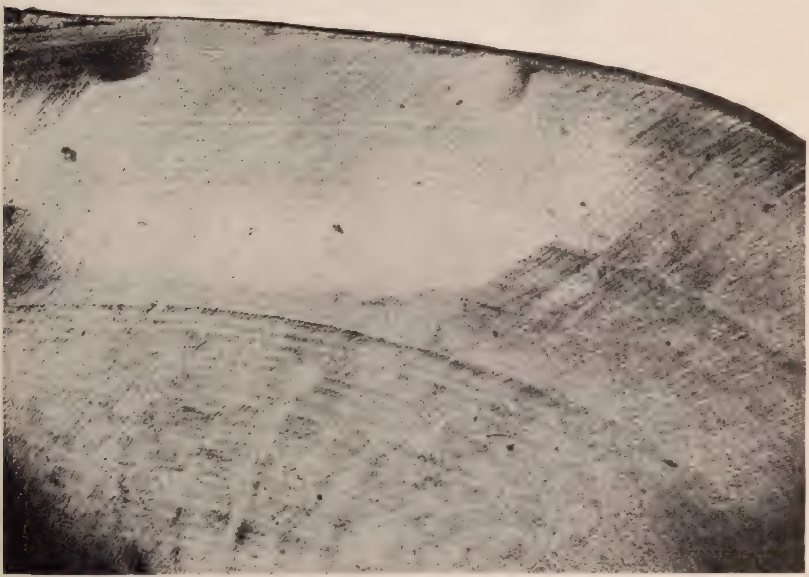


Fig. 44.—White spot in enamel. At the right hand little bundles of rods are seen to be without cementing substance.

1st. An atrophy due to a period of malnutrition, affecting those parts of several teeth at the time in process of formation. This may cause the failure of formation of all parts of the enamel and dentine in the zone involved, as seen generally in atrophied teeth.

2d. An atrophy of the enamel rods occurring in spots, as seen in pits.

3d. An atrophy of the cementing substance between the enamel rods, as seen in the white spots often seen in the enamel, and in the enamel of the whole denture in rare cases, as in the two I have described.

The first is clearly due to a general malnutrition and is seen only on the parts of teeth contemporaneously in formation at the period of the illness. The second is in part seen to occur in process of general malnutrition, but often occurs independently of this, so far as can now be discovered. The third, so far as can now be seen, depends upon some condition of nutrition as yet unknown.

I think that Callow's case should be regarded as a deformity, not an atrophy.

DENTAL FEES.*

BY DR. W. H. CHILSON, APPLETON, WIS.

At the risk of seeming egotistical, I propose to discuss with you for a few minutes the question of fees, though it is a much mooted one. All dental practitioners should have a better understanding of the subject. Fees are vital to our existence and progress; without a proper compensation for our services, the high standard for dentistry can not be maintained. It is a fact that much of high class dentistry today is sold at a price below cost; and on the other hand, much advertising dentistry is sold at a price far above its intrinsic value. It is hardly necessary for me more than to mention the fact to make you see the point, so I will not dignify the advertising side of dentistry by discussing their methods. Suffice it to say that they are not ethical, and therefore non-professional, but in effect, "They are the professional cut-throat." If they can not stand professionally themselves among the most worthy, they can at least have the satisfaction of pulling down the standard of dentistry to a level that the poorest excuse may stand and blow the blast that withers forever the intrinsic value of their professional calling. Cheapening in the arts is not the highest aim sought for it. How much better, therefore, to seek to improve art so that it may be brought to a state of perfection. It goes without saying that the most perfect service or article is the cheapest; it has always been so; it always will be. Therefore, my suggestion is, address yourselves to the highest methods attainable, that the results may be yours to give your patrons. Get good fees for your services, for without good fees there can be no leisure; without leisure there is no time for thought, and without thought no progress. They who stand in the way of professional progress are the professional cut-throats, because of the violation of every ethical principle in practice.

---

*Read before the Wisconsin State Dental Society, Oshkosh, July, 1905.

It is undeniable that the prime object we have in engaging in any sort of business or professional life is gain. Competition spurs us on for the mastery, but we can not lose sight of the fact that we must dignify our occupation. The preparation for professional pursuits requires valuable time, and a large outlay in money. One who enters upon professional study today so understands it, and when his course is finished, his diploma is given as evidence of a high calling, with a great responsibility attaching to it, namely, Usefulness, Self-respect, Dignity, Honor and Progress.

Let it be understood that we contend that no professional man can pursue a cut-throat policy in practice, and at the same time maintain an ethical attitude toward his clientele and competitors. Only striving to occupy the higher ground where there is room for all is permissible, and the only work worthy of engaging our attention.

For a better understanding of our subject, we choose to divide the practitioners of dentistry into three divisions. The first which we will deal with, we find to be a very enthusiastic individual who is always at a loss for the best methods, especially the catchy ones. His office is furnished equal to, if not better than, his wife's parlor, as an attraction to his social position. The appearance of his whole make-up is the real inducement he is putting forth. Charging reasonable fees for reasonably skillful operations is secondary. Makes no charge for extraction when preparing for dentures, nor for treatment, even though it consumes much time and skill, and when fillings are made, the necessary scaling and cleaning of teeth no charge is made, but just to get the teeth and oral cavity in a hygienic condition is compensation enough for the small details. Every real service rendered in practice, though it be small, requires compensation. They who do not see to it that fees are commensurate with all services rendered are not pursuing a safe business attitude in their occupation. While there may not be a direct attempt to advertise, yet there is a subterfuge that has a cheapening, pulling-down tendency that can not be construed in any other light than offering inducements for patronage other than professional skill. Good business methods, coupled with skill, is what may be offered.

As we enter the second division, to discuss another phase of our subject, we want to bring your attention to the modest dentist, who brings to his assistance preparation, skill, character, modesty and business methods; with these forces, coupled with industry, he is sure to succeed. When entering upon his practice he made calculation as a basis for fees the cost of his education, instruments, furniture and library, and he finds that in all matters of cost, when he is ready to announce his place of business, he has expended a sum in time and cash equivalent to $4,000; allowing one-fourth of this amount to his last investment, in fitting up his office with the necessaries to conduct his practice. As he opens his books for proper accounting, this, then, is his stock as a basis from which to figure expenses and profits. Add to this amount his daily office expenses, which we may safely say, including rent, fuel, lights and water, to be at least one dollar per day; and another important expense must be entered into the expense account, i. e., the materials used, fire insurance and taxes. We have already cited an actual expense account which is larger than the average dental practice is in our land. But just for the sake of argument place the practice income in this division at the highest average, say $10 per day, which would give the annual of $3,650. Now, then, for a clearer comprehension of our contention, let us recapitulate:

Amount spent on education		$3,000.00
Amount in purchase of furniture, instruments, library, paraphernalia, etc.		1,000.00
Interest on education, amount annually	$ 150.00	
Interest on second amount should be large enough to refurnish in ten years, and this amount must be 10 per cent annually	100.00	

Office rentals, etc.	365.00
25 per cent of $3,650, annual practice for materials	912.50
	$1,527.50

The annual charge to cost in this practice, therefore, is $1,527.50. We find the annual profit in this practice to be $2,122.50; over against this amount is to be set the dentist's time and skill for a year—not a large amount for one of such good business capacity. We may look about us and find many persons in a clerical position who command salaries much higher than this income; and when we scan the commercial and manufacturing field, we note many whose incomes are many times larger.

We are loath to approach the third division of our subject, because our contemplation fills us with thoughts not congenial, to say the least, for many here should and could occupy higher ground in practice, but a lack of self-respect and professional pride—a misspent energy in the non-essentials of life—keep them retrograding till they are almost ready to tumble off the lowest rung of the ladder. To this class we mention the suggestion to change front or quit the field, for you are a professional dead weight, and are athwart the path of dental progress. How can we furnish words sufficient to describe this nonsensical advertising, blatant, warranting dentist? We give it up. We must occupy higher ground, and attempting it, we will find the fees are the rungs of the ladder that leads to it. We all harbor optimistic ideas when we start out in the beginning, and had our business management been as good as the average successful man, we would be occupying today higher professional privileges.

We hold the practitioner cited in the first division the greatest culprit, because with splendid opportunities for business, through slovenly methods and poor business conduct, he finds when it is too late that he has been conducting a losing enterprise. Now then, as he looks about him and examines into his affairs, he quickly concludes that the matter is this, that he has not done volume enough. As he looks across the street and contemplates the successful practitioner of the second division he is sure of it, and believes that his success is due to a great volume of business. The competitor's business methods and tact have not entered his mind for solution. So he comes to a quick resolve, and lifts that six-dollar hat and places it on a ten-cent head, and hies himself for the printers, and has placed in the public print one of those grand invitations to come and get something for nothing, with a long term warrant as a clincher. Certainly, he will surely save you money, he is so unselfish. That he takes delight in working for the public interest, instead of himself and family. When he finally realizes, at the end of his usefulness, that with all his effort and a busy life he has not been successful in skill or finance, his feeling of remorse is great, and the dear crowd who have followed him that they might easily win that prize, to get something for nothing, have been justly fooled, and hold their would-be well-doer in contempt—rightly, too, because he has been the real master, the only one competent to decided what is best in any given case, and the fee that should compensate for it.

In placing before you these thoughts, it has been my aim to bring to your appreciation that good dentistry belongs to a high order of skill, and can not be acquired without preparation, integrity and perseverance. Without the aid of skillful dentistry, humanity could not have health and attain longevity. We are, therefore, as practitioners of a branch of the healing art, important factors, and can not be dispensed with. My humble opinion is that in the sphere we operate, we are quite as necessary as is the physician and surgeon, for it takes the combined skill of the three professions to keep the human body in a fair state of health. Our remedy, then, lies in the appreciation of this fact, and a fee commensurate with service rendered should be considered in every case we treat, every case we operate upon, and every denture we supply.

PYORRHEA ALVEOLARIS.*

BY DR. T. A. HARDGROVE, FOND DU LAC.

It is not the purpose of this paper to bring forth anything sensationally new regarding the study of pyorrhea alveolaris, but to contribute its small share to maintain interest in the subject until a final solution of it is established.

Dentistry has made such strides that it has become necessary to subdivide it into specialties in order that more accurate results may be attained.

The dental profession of today is making a great scientific effort to solve the question of the etiology of so-called pyorrhea alveolaris. Until its etiology can be definitely proved we must advance along the line of theory, but, after all, theory is not so bad a factor, for nothing was ever practical without being theoretical.

The greatest difference of opinion upon this subject seems to be whether it is constitutional or local. So far as the treatment is concerned it makes but little difference, for if there is any one disease which the profession is called upon to treat that is amenable to judicious surgical treatment it is the disease pyorrhea.

There are those who believe that the deposit is the result of precipitated waste urate salts, and as the theory is becoming somewhat established that urates are found between the muscle fibres elsewhere in the body, the argument could be advanced that owing to the fact that the peridental membrane contains a large amount of muscle fibre, the urates are as liable to be precipitated in contact with muscle fibre upon and around the roots of teeth as any other portion of the body. It may be true that they are just as liable to occur there as elsewhere, but why do the deposits begin at the cervical margin or thereabout and build rootwise in every case, or why does it never occur in the initial stage, say half way between the crown and the apex, if the urate or uric acid discrasia be a correct theory? Why should it yield to surgical treatment without recurrence and without constitutional treatment? If the deposit be not removed a cure will not result or the disease be arrested, even though the patient be put on constitutional treatment.

---

*Read before the Wisconsin State Dental Society, Oshkosh, July, 1905

There are those, also, who believe the disease to be the result of syphilis. If that were true, it would yield to specific treatment, the same as all other syphilitic lesions. We could prescribe for our patients the regular treatment of mercury and iodide of potassium and stand back and confidently watch the results.

Concluding, then, that the causes of this disease are more local than constitutional, it is the claim of this paper that pyorrhea alveolaris is due to a degeneration of the peridental membrane, the local causes of which may be traumatism, malposed teeth, abnormal occlusion, lack of occlusion on some teeth, an overmastication upon some one tooth, or several teeth, a lack of blood supply to the peridental membrane, a lack of care to the oral mucous membrane, a lack of friction to the gums, and a lack of general usage of the dental organs, due to the prepared foods which do not demand the same amount of mastication that was necessary in an earlier time when pyorrhea was not so prevalent. This may be the reason so many pyorrhea specialists are advising massage as part of the treatment.

The first disturbance is without a doubt a cutting off of the blood supply to a certain portion of the peridental membrane and we have stasis and hyperemia and death of a part of the membrane, which furnishes a good surface for the reception of almost any kind of a deposit, and a good harbor for the pus organisms.

Contributary systemic causes may prevent nature from offering her usual resistance or protection, some of which may be syphilis, tuberculosis, lack of nerve supply to the wall of the blood vessel to assist it in contraction, so that it may not become engorged with blood, as they always are when the disease is present.

The steps necessary to a cure are thorough removal of the deposits, surgical cleanliness of the parts, a fixing of the afflicted teeth to obtain rest and some medicinal agent that will assist nature to arrest the disease and to regenerate the tissue.

After a thorough removal of the deposits the pockets and surfaces should be thoroughly washed or flooded with warm lactic acid, full strength, or trichloractic acid, 5 per cent.

Obstinate cases may require radical treatment. In cases where the pus seems very persistent, it may be due to a little necrosis, and in order to provide a better drainage an opening should be made at the bottom of pocket through the gum. In cases where the tooth will not tighten it is a wise plan to devitalize the pulp and fill the root canal, and in still more obstinate cases it is almost a sure method to extract the tooth, slightly deepen the socket, and replace the tooth in the deepened socket and gain a new union. Massaging the gums with sulphur three or four times a day has been advised by Dr. Harlan, or a paste may be made from the following formula: boric acid, 2 oz.; tanic acid, 1 oz.; glycerine, 1 oz., and tincture of cantharides, 20 gr., the latter being preferable where there are many amalgam fillings present, as the sulphur may have a discoloring effect upon the amalgam. A prescription should be supplied to the patient for an astringent antiseptic stimulating mouth wash to be used daily.

The tooth brush may be kept sterile by taking a large size test tube and constricting it about one inch from the bottom, providing it with a rubber cork as a stopper and placing a little formalin tablet or formaldehyde in the lower chamber and the brush in the upper chamber. It will then become sterile without injury to the brush.

Before concluding it may be wise to speak with reference to fees regarding this class of work. We may not all have patients who are able to pay us ten or fifteen dollars an hour for our services, but it is possible for any dentist to obtain three, four or five dollars an hour, and a good many practitioners can afford to work for that fee.

There are many features of this disease purposely omitted which the discussion will perhaps bring out with better grace than would the reading of a lengthy paper by a junior member of this society. Should this be the case, the effort of the essayist will be amply rewarded.

A FEW REASONS WHY INLAYS SHOULD BE USED IN POSTERIOR TEETH.*

BY G. C. MARLOW, LANCASTER, WIS.

Before I take up my subject, I will speak briefly upon the demand for inlay work. While conversing with members of the profession who have not done inlay work, they invariably tell me that there is no demand for it in their locality, some stating that they have a porcelain furnace, but have never had but one or two calls for such fillings.

Dentistry is one of the leading progressive professions of the day. When new methods and appliances have proved superior to others, it is our duty as professional men to create a demand for their use. This may be a hardship for us at times, but if we are careful in making our selections, and benefit our patients thereby, it will always prove satisfactory in establishing a line of practice that we will enjoy, as well as being successful in a financial way.

In presenting this subject, I hope to be able to prove to you that we can come nearer doing justice to our patients by using inlays in the posterior teeth than we can by using gold or amalgam.

A porcelain inlay can be made and cemented into a bicuspid or molar, so it is positively a tooth preserver and practically non-destructible. That may seem like a broad statement to a beginner, but it is true. The experimental stage has practically been passed in porcelain work. It is a class of work that has come to stay.

When I took up the work it was with a feeling that porcelain was perhaps very good in its place, but its usefulness was limited to very accessible cavities in the anterior teeth only. I want to state right now that I never knew the usefulness of porcelain as a filling material until I had tested it in bicuspids and molars.

Ordinarily I make two appointments with my patient when an inlay is to be inserted. The first appointment I prepare the cavity, and make the matrix, the second appointment I have the inlay ready to set. I adjust the rubber dam, and after washing out the cavity with alcohol and thoroughly drying it with *hot air* I set the inlay under pressure by wedging, if it is a proximal filling. If a crown, buccal or lingual filling I get my pressure by use of strong rubber bands, or holding the end of a suitable instrument, or piece of wood against the inlay for about ten minutes. After trimming away the surplus cement, I coat it over with a little sticky wax to keep the moisture away, until the cement is thoroughly set, and remove the rubber dam. The whole operation of setting should not take over fifteen minutes. I think you will all agree with me that a large amalgam filling will not last longer than a few years at best. As there is no union between the tooth substance and the amalgam, the secretions are sure to work in around the filling and decay will follow sooner or later.

---

*Read before the Wisconsin State Dental Society, Oshkosh, July, 1905.

Amalgam fillings are very deceptive. They will remain in the cavity sometimes for months, or even years after decay has attacked the tooth under the filling, and possibly the pulp tissue will become diseased before the patient is aware that there is anything wrong, when on the other hand, the cavity preparation is such for inlays that in case one should loosen from poor cement, or faulty articulation, it will drop out, and then the patient can have it attended to before the tooth is injured by further decay.

We will touch upon the following reasons why inlays should be used in posterior teeth: (1) Durability, (2) compatibility or non-irritating to pulp tissue, (3) strengthens the frail walls of the tooth, (4) use of rubber dam limited as to time, (5) wide range of usefulness, (6) choice of color, (7) cleanliness, (8) general appearance.

(1) Durability—They will not wear out when exposed to mastication, neither will they deteriorate with age.

(2) Compatibility or non-irritant to pulp tissue—We can use porcelain in close proximity to the pulp without disagreeable sensations from thermal changes, thereby saving many pulps that would otherwise necessitate devitalizing.

(3) Strengthens the frail walls of the tooth—The union of the cavity wall and inlay by means of the cement is a decided support to the frail tooth structure.

(4) Use of rubber dam, as to time—I never knew what punishment was until I sat in a chair at a dental meeting, and had a gold filling pounded into a cavity in a molar, with one of those painless electric mallets. I do not wish to throw any slurs at the gold work-

ers, for some of my best friends, and some of the leading men of the profession are very adept gold workers and have elevated the standard of good workmanship more than any other class of workmen.

(5) Wide range of usefulness—It is hard to realize that inlays can be used so generally in the mouth. There is no place that a gold or amalgam filling can be used that it would not be practical to use an inlay. In fact the average practitioner can insert an inlay in a posterior or buccal cavity that will be more durable than either gold or amalgam.

(6) Choice of color—Porcelain is the only filling material in use that gives us a choice of color. It is true that we are not always able to get a perfect match to the tooth substance, but we may match at least 75 per cent of the cases, and that is a better showing than leaving out the color problem entirely as has been done heretofore. I am looking forward to the time when some noble brother of the profession will come forward with a complete solution of the color problem.

(7) Cleanliness—This is a point that is very clear to porcelain workers. Food will not adhere to porcelain fillings. If it is deposited there it is very easily removed.

(8) General appearance—There was a time when our patients were desirous of a display of gold, but that time has gone by. As an illustration: Last winter a young lady came into the office and on examination I found ten cavities in her upper teeth. I recommended inlays and she had them put in. Last week she came back, and an examination revealed twelve cavities in her lower teeth. She said: "Now, doctor, I want you to use inlays in all those cavities; I like them so much better than gold."

In presenting this subject I have made statements without hesitancy that I would hardly have ventured putting on record two years ago. In the meantime I have thoroughly convinced myself that all I have said is true.

"EXTENSION FOR PREVENTION."*

BY D. J. HUGHES, D. D. S., PALESTINE, ILL.

One of our leading dentists has said, "Operative dentistry is a combination of science and art which enables the dentist to so repair the defective human teeth that the dental arches may be preserved for the longest possible time in the best possible condition."

In the study of the saving of the human teeth we should consider that the finished work must be useful and comfortable as well as beautiful. Under the heading "Operative Dentistry" comes the proper preparation and filling of cavities, and I have taken as a topic for discussion "Extension for Prevention."

Dr. Black first made use of this phrase in 1891, and he has said that at that time a few other men were practicing this same general thought and that he crystallized the thought and brought it to the notice of dentists in general. Since that time he and Dr. Williams have given this subject a great deal of their thought and time, and at present it seems to be one of the principal topics of discussion and contention, especially between the East and West.

It is not my intention to give you any new or startling ideas on this subject, for it has been discussed by all our leading dentists in the popular dental journals, and this literature is at your command, as it belongs to the dental profession.

I take it that the object of organizing these state and local societies is for the mutual benefit and protection of the men of our profession.

We meet to exchange ideas and compare experiences and in this way become more capable and more nearly the masters of our profession.

In the beginning I want to call your attention to a case which came under my personal observation. While away at school in one of our southern cities this young lady, about 17 or 18 years old, went to a dentist and had eight or ten amalgam fillings placed in the bicuspids and molars. All of these were proximal fillings and there were also two minute gold fillings placed in the mesial surfaces of the two central incisors. In less than a year she came to my office suffering with toothache. This trouble was not due to the fact of fillings being placed too close to the pulp, but there was recurrence of decay. Upon examination we found every filling in this same condition. The cavities were not extended to areas of immunity, and there were excellent lodging places for micro-organisms. I immediately proceeded to remove the fillings and to extend these cavities well to the buccal and lingual in the bicuspids and molars, and to the labial and lingual in the incisors. I studied this case (as I think we should each individual case) and found that, since these fillings had been in place only a short time, my patient was very susceptible to caries and therefore I made the extensions great.

---

* Read at meeting of Wabash River Section Dental Society, October 17, 1905, at Newton, Ill.

Now I do not contend that these larger gold fillings in the incisors added much to my patient's beauty but I do contend that there will be less liability for a recurrence of decay and I considered it my duty to the patient to make the extension. This work has been done over a year and I had the privilege of examining it a few weeks ago and it is still in a good condition.

One important factor in extension for prevention is the absolute knowledge of the position or direction of the enamel rods and the lines of cleavage. It is important also that the operator should know the condition he is called on to treat, why it originates, how it extends and what to do to prevent it.

Dental caries is of specific origin but is influenced to a great extent by predisposing and surrounding conditions.

From the standpoint of the exciting cause these three things are necessary: There must be a specific infection, it must have a suitable habitat and must be allowed to remain undisturbed for a definite time. Dr. Black tells us that when the area of liability is removed we have fully satisfied the idea of extension for prevention. It will readily be seen that the size of these areas is by no means in all cases the same. The teeth may be round in form, making this area small, while in other cases teeth may be broad or flat on the proximal surfaces with an extensive contact surface, consequently making the area of liability much greater. Again the size of these areas may be influenced by the immunity or the susceptibility of the patient to dental caries as well as by the exercise of prophylactic measures, namely, the care given them in brushing and cleaning.

In closing I will say that I have never found it possible in practicing "Extension for Prevention" to make one distinct rule and follow it in all cases. We must study each case individually and use our best judgment as we proceed with the work.

Dr. Black, the grand old father of dentistry, always warned us of the danger of being too busy to do our patient and our work justice. He says, "Work for each patient in such a way that they can recommend you to their children and grandchildren."

His life should be an inspiration to us. With all his many duties he is never too busy to talk with the men of his profession and help them in their difficulties.

If you are interested in extension for prevention I would recommend reading his lectures or papers, or better still, go to his office and talk it over with him. He will not be too busy to receive you, and it will be an hour well spent.

THE DENTAL SOCIETY—A NECESSARY FACTOR IN PROFESSIONAL GROWTH.*

BY DR. C. W. LAWRENCE, BETHANY, ILL.

Mr. President and Members of the Macon-Moultrie Dental Society—How good that name sounds; at last it is an accomplished fact.

It gives me the greatest pleasure to read a paper before this organization, which I hope will make a name for itself in the future.

Dr. Butler and myself had talked of trying to form a dental society in Moultrie County and adjoining towns before the present plan of reorganization of the State came into existence, but as we could not secure the desired number of members the idea was abandoned. Now we have the organization and the members, and the question arises, How can we make a success of it?

---

*Read before the Macon-Moultrie Dental Society, Decatur, October 12, 1905.

After I had collected my thoughts for the paper it occurred to me that they would probably prove to be about as interesting to you as the Sunday-school lesson was to a boy of whom I remember reading the following story: The lad, who lived in the country, started for Sunday-school one hot Sunday morning, and as the road was very dusty he took off his shoes. He was soon overtaken by a rich man in a carriage who asked him to ride. He joyously got in and placed his shoes under the seat. After inquiry the man found that the boy was going to the Methodist Sunday-school. The man informed him he was going some distance beyond, to the Presbyterian church. As they drew near to the Methodist Sunday-school the gentleman said, "You are not going to put on your shoes?" "No," said the little boy. So they agreed to leave the shoes in the carriage and when the rich man returned he was to stop for the boy. Agreeing upon that they separated. The little boy sits in Sunday-school and the teacher reads the lesson to him, which by a remarkable coincidence is the story of Dives and Lazarus. Dives feeding sumptuously and Lazarus at the gate eating the crumbs from the rich man's table. After she had read the lesson to him, she wanted to see how much attention the little boy had paid, so she said, "Johnnie, where did the rich man go?" He looked at her and was surprised indeed to know that she was aware of what he had been doing. "Why, he went down to the Presbyterian church, ma'am." She was now puzzled. "No, Johnnie," she said, "he went to hell." "But, good heavens," said Johnnie, "he has my shoes!"

No doubt the first question that came to a great many of our minds when asked to join this society was, what will be its advantages, or will it pay me? My answer to the latter is most emphatically, Yes.

The dental college, the dental journal and the dental society are the progressive forces of dentistry. Without the latter you are losing more than one-third of the forward impulse.

Self respect, if nothing else, should prompt all dentists to join at least their local society. No man can long shirk his share of duty, receiving the benefits of the labor of others while contributing nothing, and command the respect of his fellows. If he win not the esteem of his neighbor how can he respect himself? All dentists must learn by experience and those who take advantage of the experience of others will learn more rapidly; this they can best do through association with other men banded together for interchange of experience. Association stimulates ambition, develops the intellect and makes one brighter and more companionable. It gives a man greater power for growth; the growing man learns something from everything he sees or hears; nothing can touch him that does not teach him, and he perfects this learning and gets the good out of it by putting it into practical application.

To brush up against successful men who are making names for themselves and their profession is very helpful, and must arouse the ambition of those who are looking on and noting the efforts of others to get to the front. It is only in the dental society that one can come in direct contact with the best men of the profession. Here he has an opportunity of comparing himself with others and learning of his own capabilities thereby. He makes acquaintances and eventually friends among the higher class of men in the profession, and let it be said that there is no better advertisement for a truly professional man than to be well known and well spoken of by his professional brethren. A man's patients are sure to meet other dentists, and mention the name of their dentist, and are little pleased to discover that they are patients of an unknown man. On the contrary, if the mention of the name receives a hearty endorsement from the other dentist, the patient feels reassured in his choice.

We can all remember the friendships formed with our classmates while in college, and on commencement day how we regretted to sever our relations with them. Friendships can be formed in the dental society with the assurance that they need not be cut asunder, but that they will grow greater from year to year.

One often sees distrust converted into friendship merely by acquaintance. In living out of the society we are apt to criticize the work that some brother in the profession may have performed, and perhaps do harm to the dentist that did the operation. As soon as we get together as brothers, instead of condemning him you find excuses for him. If it is known to the general public that you are taking an active part in dental society work your own patients know in time that you, instead of leading a life of idleness after your professional work is done, are doing something for the good of humanity. Then you will raise your professional standard in their estimation.

To the younger members of the profession the dental society is a very great help, giving them, as it does, an equal opportunity with the older and more experienced practitioners of observing the performance of operations in the clinics.

A good dental society is something of a post graduate school, and next to actual experience there is nothing so valuable; for there the collision of mind with mind awakens reflection and stimulates the mental digestive power. There you can meet your neighbors on common ground, grasp each other by the hand, look into one another's faces, and compare investigations and experiences in face to face discussions. There rivalries, jealousies, and controversies can be softened and professional friendships be formed and cemented; there you can find opportunities for pleasant social intercourse with worthy men.

No doubt many of use have asked ourselves: Why should I join a dental society? If anything of value transpires I can read it in the journals. It is true that the dental journals do much toward the distribution of knowledge, and are of great value to professional progress, but it can not be said that they take the place of the societies. A man reading an article can not rise and dispute with the author; if the argument is not quite clear he can not ask for an explanation.

If the dental journals be closely observed it will be noted that the great bulk of the matter comes originally from the dental societies.

Progress, therefore, however much aided by the publications, is nevertheless fostered by the societies that urge men to write and discuss and prepare attractive programs to induce attendance. This costs time and money and those who are partaking of the feast with no thought of the payment of the cook are little less than drones. How many of us tried pressure anesthesia the first time we read of it? I kept reading and re-reading of pressure anesthesia, but it took a demonstration of it to convince me of its merits, and then I could hardly believe it to be true. Gentlemen this one thing has been worth enough to me to repay me for all the time and money I ever spent in attending dental meetings. The same will apply to porcelain inlays, and many other things that are continually coming up in our progressive profession. You have to see them in order to know their merits. Which are you going to do, pay some man with a lot of nerve twenty-five dollars for these instructions, or come to the dental society where they are given to you gladly and freely by the very best men in the profession and not by some quack?

Right here I want to make a strong plea for lots of clinics in our meetings. To my mind they form the most important part of a program. Of course they cause a lot of work but the secret of society success could be summed up in that little word *work.*

Let us enlarge upon that word and see what kind of work produces the best results. Senator Beveridge in a recent article in the *Saturday Evening Post,* which may apply here, began thus: "All who do their best, and in doing their best do a good piece of work, deserve equal credit whether the work be little or big. The architect who builds a house has wrought for humanity as truly as the statesman who builds a government; each has fulfilled his destiny if his achievement was what he was fitted for and if he has done his best."

The cook is as necessary as the philosopher. Each of the workers of the world is required in the human cosmos. So it is with us. We want work from every member of this society. Some of us can be cooks and some poets. "It may not be that the worker himself sees that he is essential; for that matter we are all toiling as blindly as a coral insect, and yet our labor is as much a part of a symmetrical structure as is the life and perishing of a polyp."

I heard one of our members say, "I can't write a paper or give a clinic," but he can. In that very conversation he told me something about dentistry I did not know. He was giving me a word clinic and did not know it.

Very well, let each of us work, but work together—do not let discord creep in—keep it out—let each man see who can work the hardest and best, and understand that his work *does count,* and will become a part of a harmonious whole, and when we do this we will have the best dental society in the State of Illinois.

Let us now consider how our society should be conducted and some of the faults of dental societies as I can see them.

We should eliminate the reading of papers of any great scientific knowledge, which should be left to the larger societies, such as the state or national, and only subjects presented that are open questions. Too many members hesitate to take part in debate. Is it because they don't know anything or because they can't tell what they know? Certainly not. Do not let us sit around and drink everything in like sponges, but get up and squeeze ourselves occasionally and let out some of this knowledge we have absorbed, but whenever you have anything to offer, if your views differ from another express them with courtesy and respect and remember in debate, as elsewhere, that no one is infallible, and be open to conviction. If any incautious remark, misstatement or personal reflection drops from your lips, be not slow to make proper atonement; those who are positively right while all others are positively wrong, who can brook no opinion that does not accord with their own, are usually deemed hot headed and unsafe guides.

Also remember that differences of opinion are quite compatible with friendship and that discussions, no matter how sharp or exciting, are usually conducted by men of discretion without violation of the ordinary rules of good breeding.

Many societies are late in issuing programs. Very few men can present interesting thoughts in the discussion of a paper without some preparation.

The membership committees are not active enough. They are satisfied to consider the credentials of those who have their names proposed, while they should earnestly solicit every eligible dentist in their district for membership. The young graduates should especially not be neglected. Get them within the fold and make them feel there is work for them to do. They can not be as good members of their profession out of the society as they can be in it, and through the influence of the society association most of them would be saved from the temptation of immediate employment offered by advertising parlors.

The young man building up a practice probably feels too poor at first to join a society, but make him realize what he will miss before he grows indifferent, for then it is getting too late.

The dental societies are at fault for not having closer coöperation with the medical men. We often see our leading physicians aiding a class of dentists who are in every sense of the term just as much quacks as are those medical men whose advertisments of cure-alls so persistently appear in the public prints. Ask a reputable physician to assist in any way a medical quack and you will receive an emphatic refusal, but on the other hand let the applicant be a dental quack and in most instances they will forget their code of ethics and are ready and willing to earn a fee. It is my opinion that this is done without thought of the harm resulting, but even so it is inexcusable on the part of the men who do it.

This practice, while not a matter of vital importance to the success of our profession, yet is naturally annoying and it could easily be made clear to our medical associates that it is not only unpleasant to us as dentists but is clearly a breach of professional ethics.

You all know of the ignorance of most physicians respecting our profession. Recently a physician asked me if we have a code of ethics and if we have to have a license to practice our profession?

I would suggest that we have a union meeting with our medical society sometime in the future, and have some one prepare a paper of mutual interest and try and get in closer touch with our medical men.

What are some of the results of the dental society? At one time each member of the dental profession learned what he could and what he learned he kept to himself because it added to his commercial value. Through the influence of the dental society all this has been changed and a desire has been awakened in the members to give to others as freely as they have themselves received of the fruits of knowledge and experience.

If it had not been for the dental society we would not be held as high in the estimation of the people as we are, because they hold the same estimate of us as we do of ourselves, and if we by our work, and energy raise the standard in every possible way, they will also.

If we find in a town or section no society we may expect to find jealousies, envyings, slanders, and all manner of bitterness, but all this has been known to clear away like smoke before the wind after the formation ,of a society.

I have been very much surprised to find so few Decatur dentists at our state meetings, especially at our last one. I believe we have sixteen or eighteen members from Decatur in the Macon-Moultrie society and seven members from the country towns. At our last meeting at Moline there were two Decatur dentists and four of the seven of we country yaps.

You may think it is because we have more money that we can afford to go, but certainly not, for I see some Decatur dentists riding in automobiles while we have to walk to get there.

Probably some of you have not been at our state meetings because you feel as I did in regard to such men as Drs. Black, Johnson, Crouse and others, of whom we all know by reputation, feeling timid and diffident about meeting them, thinking they would hardly look at a dentist from the little town of Bethany. But, gentlemen, let me assure you such is not the case. You are not there long before you can see that there is a wholesome spirit of fraternity; the men assembled are not there for selfish purposes but to give the benefit of their acquirements to others.

In conclusion there are two things I would like to see this society do—

1st—Start a movement for an endowment fund for the benefit of those men that need it who have done something for dental science. Take our venerable Dr. Black, for instance, who has given much of his time and energy for our advancement.

All dentists are entitled to comfort in old age, for we certainly work hard enough and we should see to it that those who give up much of their time and energy for our advancement and the benefit of humanity, receive some reward financially.

Let us select a committee and lay the matter before a Rockefeller or a Carnegie and show them wherein they can do humanity a great good.

2d—We should find some means of educating the general public to their need of our services; speaking to our patients is all very well, but how many do we reach that way?

I am a believer in advertising in a way and my plan would be for the society to have supervision over it and publish pamphlets, or articles in the public prints setting forth the necessity of dental work and describing the different kinds of work, etc.

Let each member distribute all these pamphlets he sees fit, provided he pays for them. Another plan would be to have lectures given in our public schools. I believe our own Dr. Foster Waltz has already started this in Decatur. A good idea; keep it up, doctor, and we will all get returns from it.

Is it not pitiful to see a mother bring her seven, eight, nine or ten year old child into our offices with tears in its eyes and tell us the same old story, as nine out of ten do—didn't know it was a second tooth. You feel she ought to have known. But whose fault is it? Ours, and let us remedy it.

HELPFUL HINTS.*

BY A. C. WILLMAN, D. D. S., KANKAKEE, ILL.

The great army of dentists are continually thinking of better and quicker ways of accomplishing results in our professional work. These little short cuts are greatly appreciated by the average practitioner, so much so that most of our dental journals now devote a few pages each month to them and most of us read them before we do the papers and discussions.

The following suggestions are not all original with me and in calling them helpful I mean they have been helpful to me. At our county society meetings we are all glad to get from each other these little things that have helped us over some of the hard places and it is our rule to encourage the members to bring such ideas to the meetings. At our last meeting one of our members informed us that he had found a common slate pencil better for teasing solder than an instrument. The solder does not adhere to it and it does not heat up and burn the fingers. It can also be used for stirring fusible alloy.

A small knife blade, fastened to your cabinet in a convenient situation, offers a quick means of cutting your dental floss, on the same principle that thread is cut on a sewing machine presser-foot. If you wish to use a barbed broach in one of the posterior teeth, cut it the desired length and attach a small amount of sealing wax to the end for a handle. This will allow you to get a grip on it and at the same time enable you to judge accurately as to the amount of force you are using to avoid breaking it. When we use a large handle we are very apt to exert, unconsciously, so much force as to twist it in two.

---

*Read before the Northern Illinois Dental Society, at Elgin, October, 1905.

A small box, 2½x12 inches, and 1½ inches deep, can easily be constructed and attached to your Allen table for the purpose of holding your small medicine bottles. A box of that size will hold twenty-two bottles, a double row the entire length of the table. You always know just where to find the preparation you want and it is within reach. When the bottles are kept in the cabinet or on a shelf they must be reached for, and placed on the operating table, where they take up valuable space and where they are often overturned and contents spilled over your instruments. When you are through with them they must be returned to their respective places, whereas, when they are attached to the table much time and annoyance is saved. You have only to remove the stopper and after using what you need replace it.

A brother dentist showed me that a pair of artists' compasses are very useful in measuring the length and width of teeth in or out of the mouth. In selecting facings or Logan crowns they are invaluable. If you wish to make a band for a gold crown you can find the exact width in the mouth and with one scratch mark it on the gold, thus saving considerable waste.

A number of discarded watch crystals, obtained from your jeweler, are very useful for small mixes of medicines or other preparations.

A short piece of rubber tubing slipped over your automatic plugger will make your fingers feel glad. It gives you a better grip, does not become slippery, and thus relieves the fingers of the strain they are otherwise compelled to undergo.

A block of hard wood, 5¾ inches square, with five rows of holes three-eighths inch in diameter, makes a serviceable bur block. Two rows are for the right angle burs and three for the straight hand piece. Each hole will hold one dozen burs and I have found it a very convenient way of keeping my burs where I can find them.

If a mandrel becomes so rusted or worn that the screw no longer holds, a light blow with a hammer will flatten the hole slightly and cause the threads to hold as good as ever.

When a root about to receive a shell crown is a little too short to afford a good hold, a very small brass wood screw screwed into the canal will give you a feeling of security. The projecting head gives the cement a grip it otherwise would not have.

I have found small squares of bleached muslin very useful when removing deposits from the teeth. They can be held in the left hand and the instruments wiped on them instead of your dental napkins. This saves appearances; also the napkins. They are cut 2½ or 3 inches square and may be used for a variety of other purposes which will readily suggest themselves.

Now if we step into the laboratory, we can save time and gas by attaching to our Bunsen burner an ordinary by-pass. It affords a ready and convenient means of turning the flame up or down at a moment's notice.

In waxing up plates it is very convenient to have some melted wax where you can dip into it at any time. A small tin cover may be riveted to a wire frame in such a manner as to keep it at the proper height above your Bunsen flame. The one I have is kept three and one-half inches above the flame, and at that height the wax is kept melted and yet does not boil over.

It is often difficult to securely wax together a broken plate, especially a lower partial. The attempt to hold the broken pieces in one hand while you attach them with the other makes you wish you had three or four hands. If a strip of wax, such as the dental depots use to attach a set of teeth to, be softened and laid on a flat, unyielding surface, a piece of glass for instance, the broken plate may be pressed, teeth down, into the wax, using both hands to hold the pieces in proper position. When you let go, they will remain in place and you are free to examine carefully and wax together.

When packing a plate many lay a napkin over a dish of hot water, allowing the steam to soften the vulcanite rubber. The napkin often sags down into the water or slips off and causes considerable annoyance. By stretching a single thickness over a wooden embroidery hoop you have an ideal contrivance. The rubber will not fall off or stick to the napkin and you will be pleased with the result.

In giving the final polish to rubber plates, I find that a polishing wheel made of about twenty-five thicknesses of unbleached muslin gives a better finish than chamois skin or a soft brush wheel. The edges of the circles of cloth become frayed and do not scratch. I can get a finer polish with this kind of polishing wheel than with anything else I know of.

Now, in conclusion, let me say that I do not feel that I am presenting anything very new, at least not to some of the older men. I realize that these suggestions will be of little interest to those who have something equally good or better, but there are always some to whom they are new and welcome. If you have better or quicker ways of accomplishing the same results, or if you know of anything along this line that you feel might be of interest, let us hear from you in the discussion which is to follow. It may seem trivial to you and hardly worth mentioning, but it may be just the thing some other fellow is looking for.

PORCELAIN INLAYS.*

BY DR. GEORGE T. BANZET, CHICAGO, ILL.

It is with some trepidation that I approach the subject of porcelain inlays, a subject which has been so often and so thoroughly covered by our most able members, and it is only the necessity I feel of interesting all dentists in the subject which calls forth this paper. It is my positive conviction that inlays have come to stay and as the most prominent men in the profession are inserting them, many almost exclusively, it means that all others should get in line and also do the work.

From my viewpoint it seems to be absolutely necessary, as your patients are becoming educated to the advantages of inlays, advantages esthetic as well as pain saving, and you must be able to do the work to retain them. In addition to that you will observe that your most highly cultured patients, and consequently those for whom you prefer to do work, are the ones most desirous of this class of operations, and furthermore are those able to pay the higher fees, which always appeals to the man doing the work.

Do not be misled by operators who say, as an inducement to taking up the work, that it is as easy as gold filling. It is not as easy, by a great percentage. Much more care and skill is required to secure an inlay which will compare, as a finished piece of work, with a gold filling. However, it becomes easier with practice, and I am sure that the dentist now inserting inlays finds the work much less fatiguing and more interesting than when inserting gold fillings of the same number.

---

*Read before the Northern Illinois Dental Society, Elgin, October 18, 1905.

It is advisable to do the experimental work on models, as one can save one's self much humiliation by securing some practice in burnishing and matching colors before trying to insert an inlay for a patient. When a practical case presents first secure a good separation, for a beginner the greater the better. With experience one becomes able to achieve good results with less separation.

I so seldom take an impression of a cavity that I might almost say that I always burnish my matrices. It is only in rarely occurring cases that it is necessary to employ the impression method.

It will be impossible, in a paper of this character, to go into cavity preparation to any extent. It is an axiom of inlay cavity preparation that you be able to withdraw the matrix from the cavity without distorting it. The walls should be prepared as nearly paralel as possible, and yet admit of the withdrawal of the matrix. Every cavity should have a flat seat, or grooves can be obtained cervically and labially or lingually, as the case presents, which will assist materially in the retention of the inlay.

I wish right here to abolish the *bete-noir* of beginners of inlay work. That is the fear of getting folds in the matrix at the margins. It is of absolutely no consequence, as, if the margins be properly prepared, the folds can be burnished down to the same gauge as the remainder of the matrix. The important consideration is the adaptation of the matrix to the walls and grooves of the cavity, and the avoidance of tearing it, and this can be more surely accomplished if the folds at the margins be disregarded.

Do not understand from this that a matrix which is torn is useless, as matrices can be used which are considerably torn, if the tear does not exist at the margins; but a matrix which is not torn is much stiffer than one in which tears exist, and there is less liability of distortion. Where a matrix is torn it is necessary to employ much more care in carving to avoid distortion in the fusing.

I am going to make another radical statement in this connection, and one which will be contested by many of our best porcelain workers, but it is the result of clinical experience, and I believe I can maintain it.

Do not reburnish matrices. I will qualify this statement by saying that it is unnecessary except in very rare instances.

Learn to carve the porcelain so that the shrinkage which always occurs in fusing will not distort your matrix, and the testimony of men working along this line will bear me out in the statement that reburnishing becomes less necessary each month.

For all proximal cavities in the six anterior teeth fuse the porcelain in sections, beginning with the lingual, and continuing with the labial at subsequent fusings.

For other classes of cavities, such as labial, buccal, occlusal and compound cavities, divide the foundation body in the matrix into four or more parts. Another method is to paint the margins of the matrix with a solution of shellac, which prevents adhesion of the porcelain. This procedure will secure absence of distortion, and render reburnishing unnecessary.

It is also unnecessary to invest the matrix.

A question of supreme importance to the beginner is what porcelain to use. There are many porcelains on the market, both high and low fusing, and until one has had considerable experience it is difficult to determine which is the best, but my preference is the high fusing.

Eliminating the low fusing, there still remains the question as to which to use, as there exist great differences between the high fusing porcelains. I believe that better results can be obtained from a make of porcelain which provides bodies of different fusibility, as, for example, one which provides a foundation body fusing at a fixed temperature, an enamel body fusing at a lower temperature, and a finishing body which fuses at a still lower temperature.

We will assume that we have a practical case, supposedly an incisor involving the mesial angle. With the foundation body secure the contour, ordinarily with one fusing, which gives just what the word signifies, a foundation upon which to build the other bodies. Then apply the enamel bodies, of the color or colors desired, fusing them to a full glaze, and knowing absolutely that the fusing point of the foundation body has not been reached, and that it will not change its shape. Then employ the finishing body, which, fusing still lower than the enamel bodies, enables you to secure, positively without changing the color or shape, the high glaze which is essential to the finished inlay.

We must now consider the shadow problem, which some few men in the profession say does not exist for them. It exists for you and for me, and I am satisfied, judging from the work which I have seen done by some of those men, that it exists for them, notwithstanding their statements to the contrary. Always remember that the inlay which you insert will be but rarely seen as you see it, with the lip retracted and in the nearly perfect light which obtains in your office. The various artificial lights affect inlays differently, and you will frequently observe that the inlay which appeared to be a perfect match in your office will be changed in other lights, and present an appearance which you would not have deemed possible. It is advisable to draw the curtains, turn on the electricity or gas, and ascertain if it is possible to improve the color.

You will notice that nearly all mention of color is in the plural. It is because more than one color is used in every inlay, and that fact constitutes one of the strongest arguments for the use of bodies of different fusibility in the same inlay, as it enables us to employ a color which, though placed comparatively deep in the inlay, still manifests itself through the bodies of lower fusibility and greater translucency placed over it.

In selecting colors for a proximal inlay, they should be somewhat lighter than the tooth to be restored, and the further from the median line the lighter they should be.

For a labial or buccal cavity they should be somewhat darker, approaching more nearly the color of the tooth as you recede from the median line.

All inlays should be fused at least three times, as three or more bodies of different fusibility are used in each case.

The matrix is then stripped from the inlay, which is invested in wax, the margins and exterior being perfectly covered, and the cavity surface etched with hydrofluoric acid, which should be permitted to remain only long enough to roughen the surface.

The question of the cement to be used in setting the inlay now arises and it is a serious question, for if the cement be not well chosen our previous efforts will have been in vain. A cement should be employed which provides a variety of colors, and enables you to approximate the color of the tooth. It will be frequently observed that an inlay does not match as well when set with cement as when "set with saliva," and it is due in many instances to the cement changing the color of the tooth, as, for example, where you have retained a labial wall. I believe that better results can be obtained than where a cement of but one color is employed.

An hydraulic cement should be used, as it conduces much to the comfort of both patient and operator, the saliva being permitted to reach the case within two or three minutes, thus obviating the necessity of covering with varnish, etc. The excess cement should be permitted to remain until quite hard, when it can be removed, and the operation finished.

REMOVING PULP WITH LOCAL ANESTHETIC AND EUCAINE BY PRESSURE ANESTHESIA.*

BY DR. G. O. KERFOOT, BATAVIA.

Any method of doing our work in less time and with less pain and trouble to the patient is, I think, of interest to the average dentist of today. Therefore, a method of removing the pulps of teeth by pressure anesthesia, doing away with at least one, and sometimes more than one, visit of the patient to the office, and with no added pain to the patient, but frequently less, I thought might be worthy of a few minutes' consideration.

I do not advocate the use of pressure anesthesia in all cases where one may find it necessary to remove the pulp, but I think I use it in from one-half to two-thirds of my cases with good results.

My method is as follows: Put on the rubber dam, and with a sharp chisel cut away the thin edges of the cavity, then with a bur and spoons clean the cavity thoroughly.

If the pulp is exposed, avoid the exposed part until the last, when, with the use of a sharp bur and the spoon, you can generally remove all decay around the opening.

If the dentine is so thin that it is necessary to remove the pulp, or if the opening is very small, one can generally make an opening by the use of a small, sharp bur. The first thing after the

---

Read before the Northern Illinois Dental Society, at Elgin, October, 1905.

decay is removed and the opening obtained, is to cleanse the cavity. In cases where there has been no previous trouble from pain, and the pulp has been exposed at that sitting, I simply dry out the cavity with alcohol. But in cases where there has been previous trouble, and we have pulpitis or a congested condition, I cleanse the cavity with creasote, carbolic acid or lysol, then dry with alcohol. I then take a small pellet of cotton, to correspond with the size of the cavity I have to deal with. Moisten it with a local anesthetic (alvatunder, I have generally used), then touch it to the eucaine, and then insert into the cavity with the eucaine against the opening into the pulp chamber. In this way the local anesthetic is forced through the eucaine powder and thereby a strong, quick acting solution is obtained. Then take a piece of vulcanite rubber, a soft, pliable piece preferred, and place it in such a position that the edges of the cavity are covered, then apply gentle pressure with any instrument most suited to the case, increasing the pressure as the anesthetic takes effect, continuing the pressure about half a minute after the feeling has departed, then remove the rubber and cotton and with a sharp bur open into the pulp chamber, and with a broach remove the pulp as in any other case; passing the broach to the apex of the canal, giving a few turns and gently removing, when probably the pulp will be found attached.

Do not continue the pressure very long after complete anesthesia or the anesthetic will be forced through the apical foramen and cause soreness, making trouble for dentist and patient.

Have the bur required in the engine and the broach ready before applying the anesthetic, so that no time may be lost afterward.

After removing the pulp, there will probably be hemorrhage, which, if not too great, is beneficial, as it has a tendency to carry off any of the anesthetic which may have been forced through the apical foramen, and when the hemorrhage is not too profuse or extended, there will be less trouble from soreness or pericementitis.

After the hemorrhage has subsided, dry the root thoroughly and treat as preferred. My preference is campho phenique, phenol sodique or creasote. Seal with temporary stopping, being careful not to force the stopping into the cavity in such a way as to make a pressure, which will force the medicine on the root dressing through the apex.

Dismiss the patient for four or five days, when the tooth will generally be found in perfect condition for filling.

PROCEEDINGS OF SOCIETIES.

CHICAGO-ODONTOGRAPHIC SOCIETY.

A regular meeting was held October 17, 1905, with the president, Dr. W. H. Taggart, in the chair.

Dr. G. V. Black presented a paper entitled "A Study of Atrophy of the Teeth," which was illustrated by a large number of lantern slides of photographs of atrophied teeth and of photomicrographs of sections of the same.

DISCUSSION.

Dr. Truman W. Brophy:

Mr. President, Ladies and Gentlemen—I feel that the society should be congratulated on having listened to a paper by Dr. Black, who has presented the subject in such a lucid and admirable manner. I believe it is the first time in America that this subject has ever been treated by a scientific man.

I desire personally to thank him for the compliment he paid my friend, Dr. Otto Zigmundy, of Vienna, for the labors that he has indulged in in this special field. Those of us who have the pleasure of knowing Dr. Zigmundy know very well how hard he has worked so many years in the field of histology.

I was glad, indeed, that Dr. Black spoke so emphatically on the subject of so-called Hutchinson's teeth. Years ago, when studying the pathology of the teeth and of the mucous membranes, I never was able to comprehend why a distinction should be drawn between the morbid conditions of the teeth that occur prior to their eruption, or why a distinction should be made between the so-called Hutchinson's teeth and teeth that have defects from fevers and inflammations of the skin and mucous membranes other than syphilitic. We all of us know that the teeth are products, like the hair and nails, of the mucous membranes. They are really dermal appendages, and any disturbance during the formative stage of a tooth or teeth, such as eruptive fevers, scarlet fever, measles, chickenpox, anything of that character that disturbs the function of the mucous membranes, disturbs the teeth in the process of development, producing such changes as those we saw on the screen this evening, and the so-called Hutchinson's teeth. I am very glad Dr. Black emphasized this matter and made the declaration that there is no distinction between the condition called Hutchinson's teeth and its cause, and the conditions of the teeth that are due to scarlet fever, to chickenpox, and other eruptive fevers.

I will ask Dr. Noyes to project upon the screen one of the first pictures showing defective enamel structure.

Dr. Black was good enough to invite me to come down last evening to go over this work with him before reading his paper, but it was absolutely impossible for me to get there early enough. I would have been glad to have had the opportunity to know what he was going to say this evening, but I did not until I came here, consequently I am wholly unprepared to discuss the paper intelligently.

As to the term atrophy of the teeth, my understanding of the word atrophy as applied to pathology is that it is the taking away from the part; as we view it in connection with the soft parts, it means lack of proper nerve function, which results in the wasting of connective, and sometimes the muscular, tissue of the parts. The reverse is hypertrophy, which is an abnormal upbuilding of a part.

He has pointed out in the first slides what he terms atrophy of the enamel. Now, it may be, I am absolutely ignorant of the condition. However, I simply wish to express the views I hold and say that I would not consider the condition of which he speaks as an atrophy of the enamel. I can not conceive how atrophy is possible in a tissue which has never formed. I understand that there was an atrophy or destruction of the tissues from which the enamel was developed in the embryonal stage, due to some eruptive fever. The cells of the mucous membrane from which the enamel receives its origin have through this inflammatory process been destroyed or interfered with to such an extent that the process of calcification of these cells has never occurred; consequently since these epithelial cells never calcified as they should, when dipping down deep into the tissues to form the epithelial laminæ, the enamel was never formed. If I understood Dr. Black correctly he mentions two forms of atrophy: one after a part forms and the other to describe the condition of a part which has not fully formed, as shown in the presentation of the first pictures during which he speaks of atrophy. I can not understand how that can be atrophy, because we have nothing to atrophy. The word atrophy literally implies, in one sense, as derived from the Greek—a, without, and trophy, growth, *without growth*—and it is used by the essayist in the latter sense; notwithstanding which I believe we should use the word non-development, as it expresses the true condition and what we mean in a term that can not be misunderstood. The tissue was never developed, was never rounded out to form the enamel, and consequently atrophy could not take place. I should say it was a non-development of enamel. It is a general understanding that there is a great deal of difference between non-development of tissue and atrophy. We have at the hospital at the present time a child who has no fingers on one hand; the child never had them. We would not call that condition an atrophy of the fingers, but a lack of development of the fingers. Here was non-development of these important parts; so we have in the teeth a non-development of the enamel tissue due to a disease of the eipthelium from which the enamel has its origin. If we could make a careful examination of the nails or of the hair of the child who has defective enamel formation I think we would find occurring simultaneously with this lack of development of the enamel a defect in the other structures corresponding to the condition we find in the enamel. We see this condition when a patient suffers markedly from fever; the matrix of the nail will change for want of nutrition. Cell production is interfered with, consequently a groove will form. Why? Because there is a lack of development, a failure on the part of nature to develop the soft parts into that inorganic matter that we call the nail, and the formation of enamel of the tooth is likewise interfered with.

I am more or less familiar with the work of Dr. Zigmundy, to which reference was made by Dr. Black.

I wish to have projected on the screen some microscopical specimens to enable me to point out what I mean, which will give you a better idea than I can by undertaking to describe them to you.

We see in the substance of the dentine or enamel defects apparently in the structure which has been termed by Dr. Zigmundy and Dr. Black as atrophy of these tissues. Is it an atrophy, or is it an absorption of the tissue from some cause? I would not be positive about that. It may be an atrophy, because we have had something there that was developed, that was capable of undergoing the process which we may call atrophy or a pathological change. So I admit that that may be an atrophy. But as to the failure of the enamel to grow up through the failure of the tissues that form it to develop, I would not call that atrophy.

Dr. Black in his preliminary remarks stated that there were two forms of atrophy, one due to the taking away of the tissues, a destruction of tissue, a wasting of tissue, and the other was that which existed where tissue was not formed. That is to say, the tissue not forming may be termed an atrophy. My own idea of atrophy has always been just the reverse of hypertrophy, a wasting or taking away, while hypertrophy is a building-up. Here we have not had anything to waste, so that I can not understand how it can be called an atrophy of tissue.

In conclusion it is very instructive to have subjects brought before this society that are outside of the ordinary.

I would like to have the first or second slide projected on the screen, where there is an absence of enamel on the teeth, which shows so-called Hutchinson teeth among children who have had eruptive fevers. This slide shows that there has been interference with the Malpighian layer of epithelial cells which dipping down deep into the submucous tissue with the other epithelial cells form the enamel. An inflammatory process, in all probability, has disturbed these epithelial cells, and the enamel at this point has therefore failed to form.

If we discuss the question of atrophy in connection with this subject, it would seem to me that we must speak of atrophy of the epithelium. There is no evidence that we ever had enamel cells formed in this case. If they formed we have no trace of them here. In this slide we notice that the enamel apparently is all gone from this point up (indicating). We can see dentine, but no enamel. Incomplete destruction of the epithelial cells was followed by incomplete formation of the enamel. (Here Dr. Noyes projected on the screen a slide showing the histological structure of the dentine and enamel, together with the areas of destruction.)

If the enamel were once developed round about, according to the outline given in this slide and then a process were to take place by which a general shrinkage of the whole tooth occurred, I would classify or term that as an atrophy. Here we have in this structure of the teeth some areas that Dr. Black referred to as being atrophied. I am not prepared to say whether that is atrophy or ordinary absorption of the tissue through some pathological condition of the part, perhaps a lack of nutrition, and a wasting, the same as we would get in the parts in the finger or arm where there was disturbance of or interference with the nerve supply of the arm or finger, the member no longer receiving proper stimulation, there would be defective nutrition and consequently atrophy.

Dr. George W. Cook:

It was my privilege a few days ago to go over some of these sections of teeth that Dr. Black has shown us, and it is an interesting subject to study the structure of these teeth because they portray to us the best histological appearance of tooth structure that it has ever been my privilege of study, and this work is certainly of inestimable value to the science of dentistry.

Dr. Black, as we all know, has been a constant contributor to the scientific side of dentistry for a great many years—I would not dare say how long—and to my mind he has touched upon a very important point for future scientific thought and investigation. We have been able this evening to study tooth structure in those cases in which there is a period of arrest of development in tooth form and structure that has an important and fundamental bearing on operative dentistry.

Dr. Black has named this condition atrophy of the teeth. The term to my mind is not just what I would like because atrophy in the common acceptation of the term means rather the diminution of tissue after it has been formed, while in the cases that we have here the enamel tissue and even the dentine have been arrested in their developmental processes rather than a wasting away of the structure after it has been formed. However, Dr. Black has doubtless better reasons for calling this condition atrophy than I can here give.

Max Verworn in discussing the proper seat of life says that the death of compound organisms with their widely differentiated organs and tissues depends simply upon the individual cells composing the cell community, but the phenomena that lead to death are very different in the individual forms of cell life; also it must depend upon the conditions of living substances that characterize each form and partially upon the nature that leads to the arrested processes of the cells themselves. There must be a recognition of the two great groups of cell activity which differ fundamentally from each other. In one group the normal vital processes drop out gradually without undergoing any essential change in the function of the cell. The processes that characterize this group have been called histolytic processes. The other group that characterizes vital processes is turned into perverse courses by certain lesions and degenerate before they come to a complete standstill. This last named condition has been termed retrogressive metamorphosis. Therefore, the term that Dr. Black has applied to the conditions herein described does not apply to either of the groups mentioned. The histolytic processes, as defined by the writers upon this subject consist of a gradual, constant decrease in extent and finally complete cessation of the ascending phase of the metabolism of the cell or cells in question. As the result living substance is continually undergoing decomposition in a certain measure, constantly losing volume, the cells becoming smaller until their volume has reached a point where the remnant of the cells comes to extreme disintegration, a condition which has been extensively studied by Looss in the atrophying of the tail of the tadpole. This author first noticed the loosening of the cement substances that united the cells together in the tissue, and as the process went on it was observed that the cells became more loosely bound together and finally lost their adhesive properties between each other and the tissue that entered into this process showed morphological changes both in the nucleus and cytoplasmia of the cell. This process seems, according to Looss and Verworn, to be typical atrophy. With the explanation of these authors as to what we should term atrophy in living cell processes, I question whether the term atrophy applied to the tissues here under consideration is really justifiable or not.

While the other form of atrophy above mentioned seems to partake of a pathological change in the tissue, at times it is extremely active, while at other times the condition may be prolonged until an organ or the particular kind of cell tissue that has entered into the process comes to a complete standstill, a condition that has been described by a number of writers upon pathological subjects.

Ewald and Hering have established the use of two terms that seem very applicable in the discussion of any subject pertaining to tissue development, and yet I question whether or not this schematic expression of the elementary vital processes of the construction of tooth substance that we have before us this evening for consideration gives us a true explanation of the physiological processes that are carried on in the formation of tooth tissue.

The terms that have been used by the above named authors in the discussion of cell physiology, as pertains to the higher forms of cell life, are assimilation and dissimilation. The first is applied to all the metabolic processes that go on in the construction of normal physiological and morphological tissue. The latter is the term that is applied to all the processes that enter into the taking care of the waste products that is incident to the normal physiological forces that enter into the chemical and physical forces that are operating for the normal maintenance of life processes.

The condition that we have before us for discussion this evening is one in which the assimilative and dissimilative processes have been interfered with both chemically and physically, and we usually attribute such conditions to the interference of the normal processes of life by disease of some description, most commonly those designated as acute infectious diseases. No dentist who has practiced for any length of time could fail to solicit information relative to the causation of this trouble without finding that these individuals had suffered some illness during the formative period of these teeth. We all know that there are certain organs and tissues that are affected in their physiological processes by a diseased condition, perhaps quite remote from the organ in which the morphological manifestations make their appearance. Not only does this morphological change make its appearance in the higher forms of the animal kingdom, but these conditions are to be observed more or less in the vegetable and all species of animal life.

It would be easy for me to relate to you many observations with reference to the causation of these conditions, but I had never thought of applying the term atrophy to such cases for the simple reason that I looked upon the condition as one that results from the functional disturbance during the formative period rather than one in which the tissue degenerated after it had been formed. And I question whether the term atrophy is one that furnishes us with the best explanation of the condition, but, as I have said before, Dr. Black has a just reason for the application of the term under consideration, and I want to thank Dr. Black personally for the privilege of studying this subject with him and to hear the many explanations of the conditions that are involved in this obscure and essential subject, because it has a fundamental bearing on the science of dentistry and should be more closely studied by all, and more especially by those who only consider the bread and butter side of dentistry, for it will certainly strengthen their judgment in operative procedures.

DR. FRED B. NOYES:

I have been much interested in this subject all the way through, the preparation of this paper especially, and for a good while before. It is too late to consume much time in talking.

It seems to me, there has been a tendency on the part of a great many people in investigating a subject to run after new names, with which I have very little sympathy. When one attempts the investigation of a subject, it is very seldom that there is something absolutely and entirely new, but it is something which has before occupied the attention of the profession and to which the profession has already given a name. It would become endlessly confusing if every investigator of a subject added a new name to that subject, although the previous one may not be absolutely perfect. There is justification for the continuance of the term atrophy which has been applied to this particular kind of deformity of teeth, regardless of the technical discussion to which we have just listened. In a discussion, however, as to the technical propriety of the term, I think it is absolutely necessary to remember that the enamel is unique among the tissues of the body. It is entirely different from any other tissue, and consequently in applying the term which is generally applied to other tissues of the body we will find technical differences.

Leaving aside that phase of the subject, there are one or two points in connection with this admirable paper that were especially interesting to me. First, the explanation of the way in which the interruption of development produced the deformity of the tooth crown, showing a slipping together of these developmental lines, and shortening and thickening of the resulting crown, not only from the loss of tissue, but from a slipping together of the parts which were actually formed—a slipping into each other, so to speak.

Then, with reference to the development of the supplementary portions of the paper, the cases of Callow's and Bronte's are not atrophies, but are deformities of the enamel. Here we have something which becomes exceedingly interesting to me, at least in the formation of pits which accompany atrophy. Here is a condition which is not typical of atrophy, but may occur without atrophy. These pits are so typical of Callow's case. We have a lack of development of the enamel rods and formation of cementum substance. The enamel rods are disturbed and the cementum substance fills up the gap, more or less. In the other case we have a complete formation of the enamel rods and absolute lack of cementum substance. That suggests something which to me is of very great value in the future study of tooth development. It certainly suggests that in the development of the enamel the rods are formed from one source, and the cementum substance is formed from another source, and one can get disturbance of one without disturbance of the other. That is a tangible laboratory subject for investigation, and these are the subjects that become important in the development of the scientific side of our profession. The minute we get a problem that is capable of laboratory tests, then we can advance our knowledge of that subject. Any theory, any notion, which is not capable of laboratory test can not be worked out and becomes of very little scientific value.

Dr. J. Austin Dunn

Was asked to report a case of atrophy of the teeth which he has under observation and treatment, but he said the hour was so late that he preferred to defer the matter, and report the case at some future meeting.

Dr. G. V. Black:

With reference to Dr. Dunn's case, I have a written report of it in my paper, but in my hurry to get through I failed to read it. It is probably a case of atrophy of the teeth, but if so, a very unusual one, in that all the teeth are marked except the third molars. The case is of sufficient interest for us to spend an evening over, and I think this ought to be done. It is remarkable in its general characteristics. I have examined it myself before anything was done, and I have seen it occasionally as repairs have been made.

On motion of Dr. J. G. Reid, Dr. Dunn was instructed to write out a report of his case and send it to the editor of THE DENTAL REVIEW for publication as a part of the proceedings of this meeting.

DR. DUNN'S REPORT:

The case which Dr. Black has referred to is of a young lady 17 years of age.

The incisors and cuspids of both jaws are conical in shape, the surfaces irregular and more or less grooved, and pitted, with very little enamel excepting at the gingival lines, where it it normal. The bicuspids are nearly normal in all respects. The first molars of both jaws have not developed above the gingival lines, having a flat glassy brown surface with no sign of a pulp chamber. The mesial third of the second lower molars have developed, but the middle and distal portions are only partly developed and irregular. The second upper molars are normal, excepting the occlusal surfaces, which are flat. The third molars are fully developed, and this can probably be accounted for from the fact that the young lady was in delicate health up to her seventh year, when there was a decided improvement. All of the teeth are brown in color, excepting the third molars, with roots fully developed. The twelve upper teeth have been restored by means of the tube, or cylinder method, without the least sign of sensitiveness.

The history of this case covers three generations, namely, the young lady's grandfather, father and brother, also two sisters of the father and some of their children. Her brother has three children, of which two have normally developed teeth, but the crowns of the deciduous teeth of the girl baby, two years of age, have not developed, being flat, and even with the gums and brown in color.

A married sister has perfectly formed teeth, also her children. In this connection I wish to ask why should this child be the only one in the family to develop a normal set of teeth? My answer is, that she is "like her mother in every way," and I believe that the mother's personality was so strong that it dominated during gestation to such an extent that it overcame even a strong hereditary tendency from the paternal side.

This case is similar to two reported in the American System of Dentistry, vol. 3, page 415, by Dr. W. C. Barrett, of Buffalo, and Dr. D. B. Freeman, of Chicago. I find by comparison that this case is more extensive than those just referred to, and besides we have both heredity and atrophy as etiological elements to consider, hence it is difficult to classify this particular case.

Inasmuch as local atrophy, as applied to the teeth, was questioned in the discussion, I wish to say that I am inclined to believe, from careful study, that Dr. Black is correct. For instance, in one case we have atrophy of a fully developed organ, and in the other atrophy of an organ during the formative period, but *interrupted nutrition* as the *cause* in *both* cases, each producing a *defective* organ, whether it be fully developed or in process of development.

Dr. E. J. Perry:

While I have been very much interested in and edified by Dr. Black's admirable paper, yet the question that appeals to me is a practical one, namely, how to treat these cases of atrophy of the teeth when they come under our observation. Many of the gentlemen present no doubt have some method of treating this condition and personally I would like very much to hear from them.

Dr. Black (closing the discussion):

I have very little to say in closing, as the hour is too late. I was a little disappointed in the time I consumed as I had to hurry over the last part of the work in order to give more time to the discussion.

First, in regard to the word atrophy. We have trophic nerves, trophic systems, that preside over nutrition. Hypertrophy is overnutrition, overgrowth. Hypo-trophy would mean less than normal growth; while atrophy means without growth. I have used the term exactly in its original signification. The term has been used to represent wasting. There is an atrophy, that is, there is absence of the trophic performances in the wasting, but there is also a wasting. There is no growth, and that is what atrophy means. It has been switched to the other meaning, and is used frequently in that sense.

In regard to the atrophy of the tadpole's tail, I should consider that more of an absorption than an atrophy. But there is a failure of the trophic performances before the absorption begins. When the failure of growth occurs, or of the trophic processes, absorption occurs and the tadpole loses his tail.

The points brought out by Dr. Noyes I wish to emphasize most strongly, and yet it seems difficult to do so. The conditions which I have described emphasize as strongly as it seems to me possible, that we have three conditions—a condition in which growth fails, that is, the whole enamel, the whole dentine over a zone; a condition of the enamel in which the rods fail, forming the pits; a condition of the enamel in which the cementing substance between the rods fails, forming a loose, jagged enamel, so that one can stick an instrument through it, yet the rods are hard. We have these three conditions in the enamel. They are all failures of the trophic performances or of nutrition—of growth.

I am very glad Dr. Dunn's case is to be looked into. It would have been well to have heard his description of the manner of treating the case. The treatment is a very important part, as he would report it.

WISCONSIN STATE DENTAL SOCIETY, OSHKOSH, JULY, 1905.

Discussion of Dr. Chilson's paper on "Dental Fees."

DR. H. L. BANZHAF:

I very much enjoyed the paper, but I am very sorry that I did not have an opportunity of looking it over before coming here. I think the suggestions made are very timely, and I am very sorry more young men are not present. I wish that every young man in Wisconsin who is about to begin the practice of dentistry, or who has been practicing dentistry on inflated values—if I may use that term—might have been present to have listened to this essay, from a man who perhaps is well known to have been standing upon a good financial rock. I believe in dentistry as in everything else that sound business methods should be considered; and it is my conviction that the young men do not absorb sufficient business training in connection with their professional training before they begin the practice of dentistry. One thing that struck me forcibly was that Dr. Chilson refers to charging for every service rendered. I think that is the basic principle, and that is the meat of this paper: the idea of charging for every service rendered. That is a good business method. I am sure if you will think of the attorneys, the physicians and the surgeons you have employed, the probability is that you have paid them for every service they have rendered. I believe that the equity of this proposition rests upon the service rendered, and not upon any fixed fee for any given service. I believe the patients who come to us will appreciate us, and rate us according to the value we place upon our services. I believe also that young men, as they begin practice, may so educate their patients to a proper appreciation of their ability. I believe, of course, that the matter of fees is somewhat a matter of environment. I realize that we can not all charge the same fees in the same communities; and still, after all, I believe what Dr. Chilson said is true, that we ought to charge for every service rendered. Two minutes' conversation with an intelligent patient will, I believe, effectually dispose of any difficulty in that matter.

Discussion of Dr. Hardgrove's paper on "Pyorrhea Alveolaris."

Dr. C. F. Rodolf:

I would like to ask if it is possible for the tooth to tighten up after degeneration has taken place?

Dr. T. A. Hardgrove:

If the peridental membrane is not destroyed to such an extent that the tooth will almost fall out, regeneration will take place, provided you cauterize or destroy the old surface, and set up a healthy new granulation. In case it has gone past that stage, if you extract the tooth and replant it, you will certainly get regeneration of the peridental membrane. If you make a new socket, and you get union, it is evident there has been regeneration of some vital tissues to cause the union.

Dr. C. F. Rodolf:

There is one question that has always bothered me, and that is why devitalization of the pulp had any effect upon the cure of pyorrhea. Another thing about replanting teeth, I do not believe you get a union in the tissues. I believe that the tooth is held there mechanically. I replanted a number of teeth a few years ago and four or five years afterward I noticed they were getting loose, and I would take them out and I would have merely the enamel; the rest was absorbed. Two or three years ago I took a Logan crown and baked the root on, and tried to restore a central incisor, and I failed. I don't know why, except that it was a case of necrosis, and a great deal of absorption had taken place, and I could not hope much for the case. I do not believe those teeth are held in any way but mechanically. I do not believe any peridental membrane forms there.

Dr. T. A. Hardgrove:

The object in destroying the pulp is to benefit the peridental membrane by diverting the blood supply. The blood ordinarily nourishing the pulp is diverted to nourish the peridental membrane. That is the only solution I know of. I do not know whether there is the development of a new peridental membrane. It suffices to know that we have something to hold it there. I have replanted teeth longer ago than six or eight years, and I know them to be doing service now. I have, out of the last fifteen teeth I have replanted, had but three failures. That is my experience.

Dr. B. G. Maercklein:

Pyorrhea alveolaris is such a grave, deep, far-reaching condition that it is almost an impossibility to discuss it intelligently on short notice. The various conditions that we are likely to meet in the treatment of it can be constantly confounded one thing for another. Whether the disease is the result of a local irritant, or a constitutional dyscrasia has been discussed since I first heard of it under the name of Rigg's disease, and I believe it is as undecided as it was thirty years ago. Both sides have strong advocates, and bring proofs constantly that such and such is the case. Someone will cure a case by local treatment, and somebody else will have the same result by constitutional treatment. That two cases are seldom alike is hardly ever taken into consideration. The peculiar features that we are constantly meeting with in this disease are certainly baffling. It is probably one of the most complicated diseases to treat that we have to meet daily, and we see all varieties of it. It takes a very close discriminating observer to know in which class to put a certain case. Local treatment will give good results in a majority of cases; perhaps the great majority of cases; but in spite of all that some cases remain that are absolutely beyond the control of local or constitutional treatment combined. What is at the bottom of those cases I do not know, and I am sorry to say that I do not know of anybody that does know. We have certainly not yet arrived at the correct etiology of the disease. The peculiar conditions that are brought about by the peculiar physical conditions of the body I do not think have ever been carefully studied. Individually I recalled a case this afternoon in speaking to some friends, of a gentleman who was prominent some years ago in our state as a state officer, who in 1861 had a tooth filled by a Milwaukee dentist, Dr. Batcheler, at a time just prior to going into the army. It was a right upper bicuspid on the distal surface, with a dead pulp. He filled it with amalgam, because he said he didn't think it was worth anything more. The man went through four years of army life, and had various troubles and diseases. He afterward took a three years' course in a law school and graduated from the University of Wisconsin. As a lawyer he eventually practiced in Milwaukee. I had charge of his teeth for a large number of years prior to his death. He died a few years ago. There was a peculiar condition. Every one of his teeth were afflicted with pyorrhea—he was rather careless about the care of his teeth—and they were all lost with the exception of the right upper bicuspid, and that tooth was as free from any disease of the gum as any tooth in this room at the present time. Now, there is a peculiar condition. How are you going to account for it? Is it constitutional; is it local? Has the pulp anything to do with the preservation of the peridental membrane, or was it due, possibly, to the peculiar effect of the alloy in that tooth to guard that tooth from the effects of the local irritation or constitutional vices? It is a question for deep investigation and study. I could not answer it. Quite a large number of my friends saw the mouth, and saw the tooth, and saw that the margins of the gum of that bicuspid were free from disease. He lost most of the other teeth by their eventually dropping from the gums, in spite of all the treatment; and that tooth remained free. There is another class which comes under a condition that I have seldom if ever heard spoken of: a constitutional effect. You have a patient, say a young girl perfectly well and healthy for a number of years in your care, and her gums are as free from any cause of disease as they can possibly be; a well proportioned, healthy girl. She marries. Her husband has been unfortunate on the subject of syphilitic infection; a so-called "cured" case, perhaps five or six or eight or ten years before marriage. The woman conceives and gives birth to a child. She never has any active symptoms of syphilis, although you can find traces of syphilitic condition in the child. One of the parents must have been syphilitic, and as we know, it is usually the father. If you have had charge of the patient prior to marriage you have reason to believe that the mother was free. Now, after that child is born, in a few years' time a degenerative process sets up in the peridental membrane; ulcers form and the teeth loosen, and in spite of constitutional and local treatment those teeth are lost one after another. You can not save them. What is the cause of it? Is it constitutional? Is it local? You exhaust your local remedies in cleanliness and treatment; and when you think you have got the disease entirely under control it breaks out in another tooth. After you have treated the case ten or twelve years you come to the conclusion, as Dr. Darby, my professor, said, that after a period of twelve years he had lost the teeth out of the mouth, and he had the patient now perfectly cured of pyorrhea. (Laughter.)

Those are conditions that we meet. Now, there is a condition that I have termed for my own specific illustration a "bastard" condition of syphilis, for want of a better name. It is not really a condition of syphilis, but it is a contamination of it. The offspring has received some of that contamination, and the mother has been infected. Once in a while you will find that class of cases where the mother escapes; remains free. The father may lose all of his teeth by pyorrhea.

Now, as to the local conditions: You may find conditions simply the result of local irritation, salivary calculus; no constitutional phases present anywhere. I had a case a few years ago where the teeth were all sound, only two small fillings; a full complement of teeth; a woman about forty years of age, married, and with no children. The teeth were all covered with tartar, they were loose, and three dentists refused to clean them, for fear they would extract all the teeth in the process of cleaning. There was a local condition perhaps; not constitutional. It took me half a dozen sittings to get the teeth cleaned. I tied half a dozen of them together, to hold them while I was cleaning them. I began a systematic treatment. If I should allow that patient to pass inspection before this assemblage I would wager that if you were asked the question, "Are all of those so far gone, or any of them so far gone, that they should be extracted?" The answer would be: "No, they are all good; fine, healthy teeth."

The question was asked: "Can the peridental membrane be regenerated after it has once been destroyed?" I think, under favorable conditions, it can be regenerated; but under unfavorable conditions can you do anything to cause regeneration of it? It is very questionable in my mind. These teeth became firm in this last case I have referred to of this woman. The teeth were treated for a period of over two years, weekly; cleansed, scaled and every little particle of accumulation removed. They were constantly treated. The gums began to recede, the pockets disappeared, and they began to hug close to the roots where they were still adherent. There was absolutely no question in the minds of those who saw the case, myself included, that the gums had come up on the lower teeth and down on the upper teeth to nearly half a tooth, where they were scaled, and they are adherent around the edges of those teeth. There are no free pockets. There was a certain amount of healthy peridental membrane around the roots, as well as in the sockets. Possibly there was only a little granulation, the same as in replantation, but they have come up, and the peridental membrane has been reproduced, and every one of those teeth are solid in their sockets and free from irritation today.

We can go on and cite that class of cases from now until doomsday and not exhaust the subject. I want to call attention to one point: The careful treatment and scaling of teeth afflicted with pyorrhea. I once mentioned this to the Society several years ago. Just above in the lower teeth and below in the uppers, where the gums are adherent still to the root, or to the peridental membrane, where there is still union—just about that line there is a peculiar formation of a rough, uneven deposit upon the roots of the teeth, and that deposit recurs time and time and again for almost an innumerable number of times until you get the disease completely under control. You can scale it off. You can find it with the fine flat scalers. You find it on the push, and not on the pull. You find it giving way, and then you feel the soft fibrous connective tissue of the peridental membrane; it becomes sensitive. You clean that off, and in a few weeks you find a redeposit almost of that same kind on this tooth. As long as there is a trace of that disease you find that deposit. What that deposit consists of I don't know; whether urates, lime salts—whether it is an effort on the part of nature to throw out some lime salts to reincarcerate those teeth I don't know; but I am absolutely convinced it does exist, and it is one of the most difficult things to remove. Another thing I am positive of: Unless you keep that deposit away, keep that tooth scaled, you will not succeeded in curing a single case of simple pyorrhea; I don't care what methods you use. That has got to be removed before you can get any healthy reaction setting in. I do not pretend to be at the bottom of the etiology of the disease. If it is a local irritant, possibly a germ, as some have made out, a germicide is absolutely indicated. Now what is one of the best germicides? Bichloride of mercury or formaldehyde? Which can we use? Which is the most applicable? Bichloride of mercury is not a good or a safe remedy to use in connection with open porous bone. It should always be used very carefully, and with great restriction; very weak. Formaldehyde you can use in a stronger solution. We can use it on porous bone; we can use it all over the mouth. It is one of the best germ destroyers we have. The Government uses it to disinfect all mail, and mail in districts afflicted with infective diseases, such as yellow fever and bubonic plague. There is a preparation put up by Parke-Davis, Known as "Euformal," which contains a large per cent of formaldehyde in solution, in connection with boracic acid, Thymol, and other preparations. We use that in full strength in the pockets of pyorrhea patients. It will bring tears to the eyes of the patient, but it will clean out the germs and all diseased tissue. It has no effect on healthy tissue. As a mouth-wash to follow in this treatment dilute it to 15 parts of water and one part of Euformal. This will give you an unusually fine mouth-wash to be used, rubbed in and used daily half a dozen times, as a preventive and antiseptic solution. I have used it for quite a number of years, and I believe I would not hesitate in saying that I would rather have that preparation at the present time than all other medicines taken together. I believe this effect is principally due to its germicidal properties.

Now, whether that is formaldehyde or anything else, that there are germs in these pockets, and that they will yield to constant treatment, I know. On the other hand, we have constitutional causes, and when we get the combination, all of your remedies and treatments are of no avail.

One word more: In connection, perhaps, not exactly with this, but in connection with the question, "Can the peridental membrane be reproduced, or will it reunite?" I want to state one case that occurred to me in March, 1881. A young girl about sixteen or seventeen years of age presented herself at my office to have a plate made of four upper incisal teeth. They had been extracted by some physician in the country. The second upper bicuspid was in mal-position and was pointing nearly in the roof of the mouth. They lived ten or twelve miles out in the country, and regulation was out of the question. The bicuspid occupied such a position that it interfered with making a plate. It stood in a slanting position, and I advised the extraction of the tooth, to which the patient readily assented. With forceps curved at 35 or 40 degrees, just as I grasped the tooth from the inside of the mouth, and was getting ready to pull, the patient gave a yell, grabbed both of my hands, and at the same instant pulled downward with a jerk, and the tooth was out. I had the tooth in the forceps and another one dropped on the floor. For a moment I was bothered to find out where it came from. I picked it up and found it was the left lower central incisor. I picked up the tooth, washed it free from dirt, placed it back in the socket while it was still bleeding, without a scrap or a scratch done to it—no devitalization or anything attempted; simply washed it off in water and placed it back in the bleeding socket, and tied it with silk floss. The patient was directed to come back in about three days' time. You remember the spring of 1881 was the one where we had snowdrifts twenty-five feet deep, and the snow was just beginning to break up when the patient was in the office. The roads became absolutely impassable for a number of weeks, and I did not see her until the following November. She then presented herself for taking the impression and making the teeth, and to our surprise that tooth had grown back into its natural position, while formerly it was a little prominent. It had been pried in between the others and union had taken place absolutely, and the pulp is alive today. I have tested it half a dozen times with ice, heated instruments, sunlight and electric light. Now there is an instance of absolute severing of the peridental membrane from the socket and a complete reunion, with the pulp alive. My brother and Dr. Wendell and several others have seen the tooth a number of times when the patient was in the office. While this does not directly pertain to the paper, it shows that the peridental membrane may reunite, may be reproduced, and the pulp remain alive.

DR. C. J. REINFRIED:

Where the tooth had been knocked out of the mouth, would that be degeneration?

DR. B. G. MAERCKLEIN:

Not degeneration, but a severing. The question has often been discussed. Professor Ingersoll, of Iowa, read a paper on that same subject some years ago, whether the peridental membrane is united, or dual—a dual membrane. As far as I know, that has about sifted down to this: In the first formation of the teeth there is a dual membrane, one on the alveolar border, and one on the root; but they soon become united, so it practically forms one membrane. Yet, when a tooth is extracted, they sever, and tear those membranes completely, a part remaining in the alveolar border and part remaining on the tooth.

Dr. R. E. Maercklein:

The essayist spoke of mal-occlusion. I would ask whether he considers mal-occlusion is the cause of the disease, or the disease is the cause of the mal-occlusion?

Dr. T. A. Hardgrove:

I could answer that question either way and be correct. If a patient has pyorrhea it could be the cause of mal-occlusion, and if he has mal-occlusion it could be the cause of pyorrhea. I said that the treatment of this disease belonged to the surgeon. Dr. Maercklein cited a case in which every tooth in the mouth was afflicted with pyorrhea except one, and that one had an amalgam filling. I think the reason it was not afflicted with pyorrhea was because the pulp was dead. That is part of the treatment. Just recently I had a case of orthodontia; six anterior teeth, and jumping the bite. In order to do so I put on an apparatus that would clear the lower teeth, so there would be no occlusion of the lower teeth during the time it was passing over. The patient was decidedly careless, and in a few weeks I noticed pyorrhea developing on the teeth out of use, so I concluded to watch the case and see what it would do. It showed the beginning of pyorrhea without the question of a doubt. I did not disturb it until I began to get afraid. After I had corrected the deformity, and restored the occlusion, I cured the pyorrhea. I believe it is evidence of what I said that with lack of occlusion you do not exercise the peridental membrane, and you get degeneration of the membrane in pyorrhea.

The syphilitic phase of the Doctor's discussion does not disagree with what I said. I said it might be a contributory cause, and so it may. Syphilitic condition of the system is liable to bring about degeneration of any membrane, and if it was causing a degeneration of the peridental membrane, the patient should have had systemic treatment; should have had mercury and iodide of potassium and things used for that purpose.

Dr. B. G. Maercklein:

Speaking of replantation, or implantation, the subject has been gone over before this Society for the last twenty years. The more conservative operators are very wary about implanting or replanting teeth. It is seldom that you will find a case that will last longer than three years. Once in a while you will find one, where there is perhaps a particularly favorable condition, and you get a union; but the great bulk of implanted teeth will last, as the Doctor has said, for about three years. They are very firm for several months; if you tap them with the instrument, the have the metallic sound; seem to be a solid mass, like hitting a dry bone. They have not got the elastic sound or percussive touch, as you have in a tooth with a live socket. Shortly after that, that condition passes away, and gradually the root of the tooth becomes absorbed, and about three years is the time limit usually of the great bulk of that class of teeth. I think I should hesitate to reimplant a tooth that I could not save while it had its peridental membrane still adhering to the periosteal surface in the alveolar border. If I could not make it steady and remain in there, I should hesitate to extract it and reimplant it, with any hope of success. In an exceptionally healthy person you might have a good chance of success, but in that class of cases it would be almost a forlorn hope, and I think the quicker you pull them out, the better.

Dr. R. E. Maercklein:

I have seen a great many cases of pyorrhea myself, but I have never seen a case in my practice where mal-occlusion produced pyorrhea. I have seen a great many cases where the pyorrhea has produced mal-occlusion, but I have not seen a single case, in all the mal-occlusions that I have seen, where I could say that they have produced pyorrhea. On the other hand, almost invariably, in all cases of pyorrhea you have mal-occlusion more or less.

Dr. H. L. Banzhaf:

May I be permitted to say a word? I agree with the essayist fully in certainly one particular, and that is his method of treating the pulp. I believe that devitalization of the pulp that is half dead is the proper treatment. I think more good can be accomplished along that line than trying to keep vicarious circulation in the pulp at the expense of the peridental membrane.

Another thing is immobilization. I think that is very important. Too little attention is given to immobilizing the teeth. We should be more painstaking in applying the splints early. I think this idea that "the tooth is just a little loose, and I won't apply the splint, because it is only a little loose," is all wrong. I believe that immobilization is indicated early.

Another good point which he mentions is massage. I believe massage is one of the early indications, and very essential. While a great deal has been said about massage, I believe that with many dentists their experience has not been very unlike mine. I formerly used to tell my patients that massage was indicated, was necessary, and I would try to instruct them how to massage the gums and improve the circulation and restore a healthy condition; but very often you find its performance is not very thorough as far as the patient is concerned. For a number of years I have met with very good success by training the patient to develop the habit of using a crash towel morning and night, and report at the end of two weeks. Perhaps at the end of that time you may dispense with the crash towel. I do not believe in continuing it after a time, but I believe we should make an effort to develop the massage habit on the part of our patient, because I feel that the patient does not usually realize the importance of massage. I think the paper is worthy of more discussion than it is being accorded.

Dr. T. A. Hardgrove:

I do not think that as large a percentage of the cases of pyorrhea can be attributed to syphilis as Dr. Maercklein thinks. I believe pyorrhea can be produced in any mouth; in the mouth of people who do not have a tendency to syphilis. I shall have a patient here tomorrow upon whom I expect to make a clinic, and I am sure he does not look to have had syphilis, and I will warrant his family history to be free from it.

Dr. B. G. Maercklein:

I would like to answer that last assertion in the words of the late Dr. Storey, of Dallas, Tex., in regard to the increase of syphilis. I will use his own words: "I defy anybody to stand up and positively assert and prove that he has not syphilis in his own system." We may think we are free, and we may think our patients are free, and if we had the means of investigating and following it up we would probably find some grandfather or great-grandfather had syphilis; and when you have that contamination in the family once, it is pretty hard to say that you have not got it. Now that assertion will hold good regardless of what one may feel personally. I feel that I am free from it myself, as far as that is concerned, and yet I don't know what my grandfather did. I may have a trace of it handed down. I believe even further: I believe that a large amount of the so-called tubercular condition is nothing more or less than inherited syphilis; and if you had the means of tracing back far enough you would almost invariably find the source. We can not stand for ourselves, how can we stand for our patients? Their own knowledge may be deficient. They do not know. This woman I have referred to has not the least idea that she is contaminated. She is apparently a perfectly healthy woman, and if I had not had charge of her as a girl I would not be in a position to know. Again, in the words of Dr. Storey, I say: I defy anybody to prove he is absolutely free from it.

Dr. T. A. Hardgrove:

It is an assertion easily made that we can not disprove; our ancestors may have had syphilis, but who can prove that nearly every case has had syphilis, or has had it handed down? I would be as willing to disbelieve it as to believe it. Neither thing can be proved. It is only in certain cases you can prove conclusively they did have it and have got it. A large number of the medical profession today, when they can not conquer a disease, attribute its origin to syphilis. If we knew how to treat, manage and control diseases today, there would be less diagnosis of syphilis.

Although the Doctor has a wide range of authority to back his assertion, and although I respect his superior knowledge and experience, and that his opinion should have more weight than mine, because he has been longer in practice, yet I am as much entitled to my opinion as he is. (Applause.)

THE DENTAL REVIEW.

Devoted to the Advancement of Dental Science.

PUBLISHED MONTHLY.

EDITOR: C. N. JOHNSON, M. A., L. D. S., D. D. S.

Subscription price $1.00 a year including postage, to all parts of the United States and its possessions, Cuba, Canada and Mexico. All other countries $1.75 a year.

EDITORIAL.

PUBLIC SUPERVISION OF THE DENTAL DISEASES OF CHILDREN.

In any movement of the civic authorities to supervise the health or well-being of the citizen there is always to be encountered a certain amount of prejudice on the part of those most to be benefited. There is usually an assumption by the ignorant of an infringement of personal rights, and a charge of interference with something which the individual claims is his own affair and over which the State should have no control. It takes a long time to educate the masses to the point of recognizing that the best interests of the State and the individual are indissolubly linked and that whatever tends to the elevation of the one in an equal ratio elevates the other.

The principle of State supervision of public morals and public health has gained a wider footing abroad than we have been able to attain in America, and we can learn many lessons from foreign governments in this respect. One of the most potent factors in bringing about reforms of this character is to be found in the influence of the public press. When the editors of our representative dailies become fully alive to the importance of educating the people along these lines we shall hope for a radical awakening of the public sentiment in favor of a reform which can result in nothing but good.

In this connection there is no line of effort more potent for the future physical welfare of the masses than a just supervision of the condition of the teeth of the public school children, and it is very gratifying to note that at least one Chicago paper is taking a correct stand on this important question. In the *Chicago Evening Post* of

January 15, 1906, is the following intelligent and altogether commendable editorial:

CARE OF SCHOOL CHILDREN'S TEETH.

Strassburg, Darmstadt, Mulhausen and several other cities of Germany have recently begun to provide the children in the public schools with dental advice and treatment, making the proper care of the teeth compulsory.

In Strassburg the first dental clinic for the schools was opened in 1902. The first year the teeth of 5,343 children were examined and treatment was given to 2,666. In 1903 the number of children examined was 6,900, and 4,967 were treated. In 1904 the examinations numbered 12,691 and 6,828 were treated, for whom 7,065 teeth were filled and 7,985 were pulled.

Of the children between the ages of 3 and 6 years only 362 out of 2,269—less than 16 per cent—had teeth wholly sound; while between the ages of 6 and 8 years only 160 out of a total of 2,103—about 7½ per cent—were free from defects.

United States Consul Brittain reports that the children are taught to clean their teeth three times a day, especially just before going to bed, and each child receives a tooth brush and instruction in its use.

Since the introduction of the treatment of the teeth in the schools there has been a marked improvement in the general health of the children, there being less headache, earache and stomach trouble.

Physicians generally admit that many of the maladies of childhood are due to, or are aggravated by, defective teeth, but too often the teeth are not taken greatly into consideration in the care of children's health. Decay is not checked until too late to have the teeth filled properly, and the health of the sufferers is affected during the decaying period. Moreover, many valuable teeth are thus wholly sacrificed, to the great subsequent inconvenience of the patients.

Unfortunately, too many people never pay much attention to their teeth until the latter make demands that can not be ignored. If the dental clinic should be instituted in this country for the care of school children's teeth it might add to the cost of the schools, but the results would be an enormous saving to the people.

THE EDITOR'S DESK.

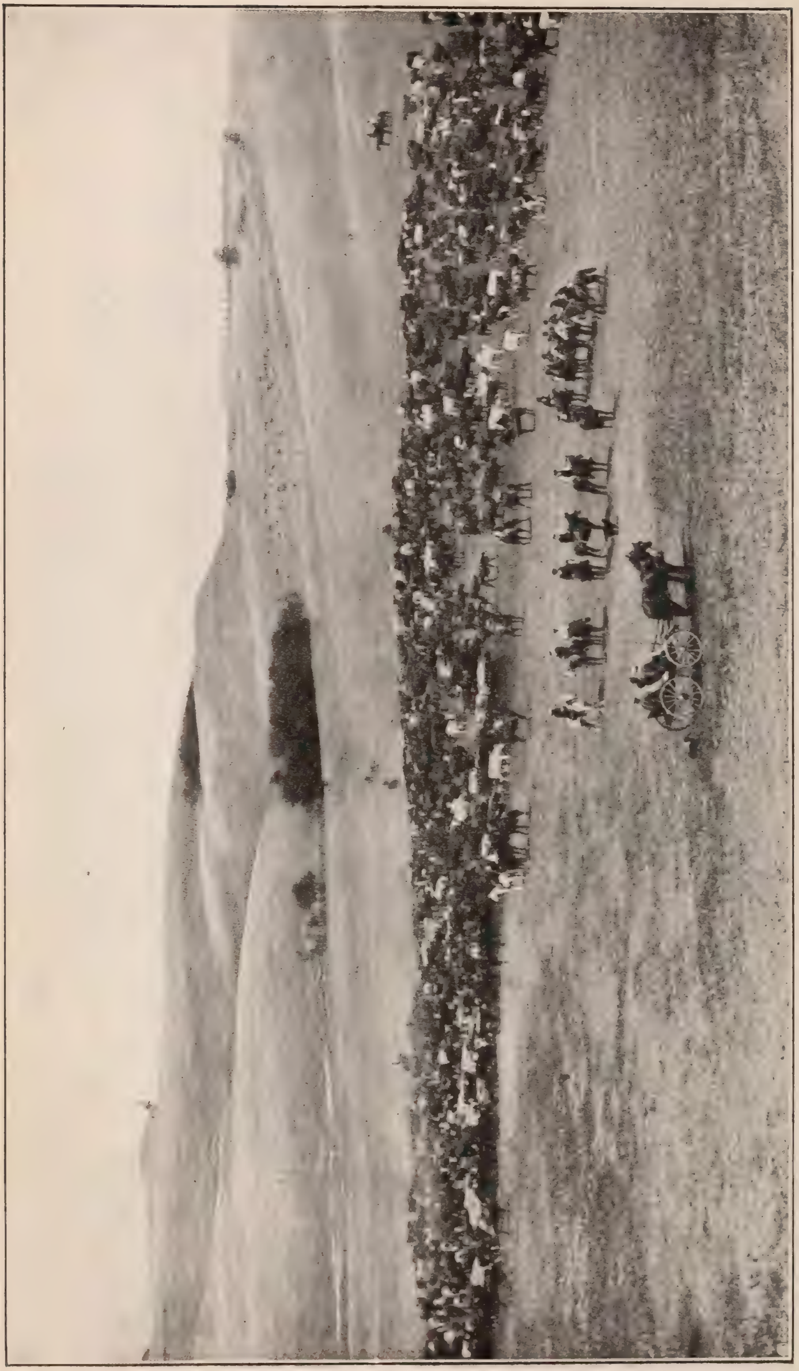
MY SUMMER VACATION.

[Continued from January DENTAL REVIEW.]

LIFE ON THE RANCH.

All my days I have wanted a taste of ranch life, and this time I have it to my heart's content and under the most favorable conditions. There is no detail left out for our enjoyment. We are among the dearest friends on earth who study our happiness from morning till night, and who possess never-ending resources of entertainment. The new Auntie, whom we have never seen before, is a jewel of hospitality and never overlooks anything for our comfort from a tasty lunch when we go fishing to a cool lemonade after a long day's ride. And such rides as we did have! I had not been on horseback for about eighteen years, but when I saw those saddle horses and the big stock saddles I instantly fell a willing victim. I have often wondered how cowboys could successfully remain seated on a bucking broncho, but after a critical examination of those saddles I am no longer surprised. They are built like a rocking chair and are so high in front and behind that a horse would have to toss a man as high as a pine tree to get him off.

My first experience of mountain climbing on horseback came shortly after we reached the ranch. Some cattle had to be rounded up for market, and it was arranged for the Indian Girl and myself to go along. Uncle provided a sure-footed horse for me, and for the Indian Girl one which he assured her would turn around and pick her up if she fell off. But he soon found that that Indian Girl didn't fall off. He himself rode a horse that instantly took my eye. Never have I seen a horse which appealed to me as this one did, and he shall figure somewhat prominently later in this narrative. His name is Ginger, and I always rode him after this first trip. When we started out that morning I had no idea what kind of a trail we had to ride over. The cattle were up on the mountain, running over the summer ranges, and where cattle could go, of course, we could. I didn't know British Columbia cattle so well then as I did later. The mountain looked innocent enough in the distance, but when we finally came



A Round-up of Cattle, British Columbia.

to the bottom of an abrupt bluff I searched for some trail leading around it. It never occurred to me that any trail could go up over it, but I was soon undeceived by seeing Ginger, who was ahead, begin to dig in his toes and climb. I never would have dreamed it possible for horses to get up where those horses went. Ginger would wheel sideways every few minutes and sink his hoofs in the ground to brace himself and rest. It was not long before all the horses were puffing like engines, and when they struggled toward the top you could feel the muscles under you strain and jerk with the effort. But so far as the rider is concerned it is easier riding up a mountain than down, as I learned later. And when we reached the top and looked out over the table land, what an exhilarating moment! To climb to the top of a mountain, whether on horseback or afoot, and then turn and survey the valley and country around gives one the sense of achievement.

The cattle are scattered in little bands all over the range, and principally in the patches of timber, where the feed is better during the dry season. Otty, a boy of fifteen, has been sent ahead to ride through the timber and start the cattle out, while we ride in the direction of a lake where they are in the habit of congregating. Otty rides two miles to our one, and by the time we reach the lake he has rounded up a big band. Then the separating begins, picking out the ones for market and leaving the others on the range. And here is where old Ginger shines. I came nearly forgetting my own horse in watching Ginger. The old white veteran is nearly twenty years of age and somewhat stiffened from a careless feed or drink while heated after a hard ride, and yet he forgets his age and his crippled state the moment he gets among a band of cattle. The fire of war is in his eye at once, and he darts here and there in the excitement of the chase. He can single out a steer almost as soon as his rider, and when he gets his eye on a certain animal the fur flies if that animal doesn't walk the chalk in proper order. If a steer bolts from the band Ginger is after him like a bullet. There is a sharp skirmish, brought to a sudden end by the steer swerving and loping, beaten, back to the band. But, Mr. Rider—look out! Unless you are exceedingly quick and exceedingly careful you will go over the saddle horn and over Ginger's head. Ginger has grown very wise with his years of service and has developed a healthy contempt for taking a single step more than necessary. He sees when the steer gives up just as quickly as you do, and he instantly checks himself, even to scattering the dirt in front of him with his hoofs.

When the cattle are separated and we are driving them toward the home kraal, my Indian Girl rides up to me, her face flushed with the chase and her black eyes aglow, and remarks: "Papa, isn't this glorious? I don't know whether I shall ever again be contented with city life." And, strange to say, I had that moment been thinking, by way of contrast, of the small, hot office and the noise and dirt of the distant city.

Dilly and Mabel on the Burro, Fairview Ranch, British Columbia.

We reached home about noon, having ridden ten or twelve miles, which was not a bad start for tenderfeet. It is true, I was somewhat foundered and had thrown a couple of splints on the outside of my knees, but I would not have exchanged that morning's ride for a box ticket to grand opera.

One of the chief sources of amusement for the children at the ranch was a burro. Besides The Collector, there were Dilly, nine years, and Mabel, six, and they were three of a kind when it came to fun. The burro belonged to some Indian, but had been turned out on the common to run, and had been immediately appropriated by the children. They "lassed" him in true cowboy fashion, and soon had him saddled and bridled and fit for the fray. By the way, you never hear them say "lasso" on the ranch, it is always "lass." Dilly can already throw a "lass" rope like a veteran, and there isn't an angle to the ranch game that that little rascal isn't up to. One day a band of horses came along while the children had nothing but a "lass" rope around the burro's neck, and he took a notion to run off with the horses. Dilly seized the long rope and soon the burro was scampering off dragging Dilly through the dirt. "Let go the rope," yelled her father, fearing she would be hurt. "Let him go, Dilly!" But no, sir; that wasn't a part of Dilly's program. She hung on to that rope with teeth set and her little shoes plowing up the dust like a road scraper.

I so much admired her grit that I called to her to hold on, and dashed across the yard in time to seize the rope and stop the runaway. Dilly was a sight with the dust, but the light of victory was in her eye, and when her father laughingly told her she should have let the burro go, she replied with spirit: "No, siree; why, papa, we never could 'a' catched him if he'd got off with that band of horses."

But sometimes the burro proved too much for the children. One afternoon they had gone down into the cattle shed to saddle and bridle him, and had been away a long time, when Mabel came to the kraal fence and, peeping through, beckoned me to come. I knew some mischief was up and tried to make her tell what was wanted. But Mabel was non-committal, and all I could get out of her was: "You're wanted." After I had teased her long enough I went down to the shed and there was the burro saddled and cinched up to perfection, but the bridle lay in an inglorious heap in front of him, while The Collector and Dilly were braced, one on either side, hanging to him like grim death, with a hair rope to keep him from getting away. He had suddenly acquired the idea that he didn't want the bridle on and the children had had a long and exciting tussle with him, only to be beaten in the end. I bridled him and Dilly jumped triumphantly on his back. As he started for the bars between the shed and the kraal she shouted gleefully: "Now, you'll see him buck," and when he made a bound over the lower bars she squealed with delight. Any girl but a ranch girl would have been shaken out of the saddle.

I got some snap shots of the burro with the children on, and one day I even induced my Indian Girl, in a spirit of fun, to get on his back. The result was a picture which I here reproduce.

The ranch horses are nearly all so wild that if turned out of the stable it is impossible to catch them without throwing the lasso, and I saw some very expert work in this line at Fairview. One morning there were two horses to be caught out of a band. The band was driven into a kraal, and the fun began. Tommy, sixteen years old, caught one nearly the first throw, and handed him to Otty to hold. But the other horse proved a tartar. He would dodge that rope like a football player. The kraal was quite large and Tommy didn't have a fair show. Finally, one of the ranch hands tried it,

My Indian Girl on the Burro, Fairview Ranch, British Columbia.

but with no better luck. The horse was growing wilder at each attempt. No one noticed Otty, who was fumbling with the loose end of the rope with which he held the other horse. The wild horse was shooting past him at each turn of the kraal, and suddenly Otty wheeled and quick as a flash tossed the loop over his head. Presto! he had both horses on the same rope, one at either end.

One of the most interesting days we spent at the ranch was when they branded the calves. This work had been deferred till our arrival so that we might see it, and while The Mater demurred considerably at the apparent cruelty of it, yet it was assuredly a novel and stirring scene. George, the oldest boy, had come down from the Onward ranch, thirty-two miles away, to do the branding, and the boys all rode out in the morning to round up the herd. I suppose I shall always be daffy about horses. George's saddle horse caught my eye at once, and I soon found out he had a reputation. He is one of the best cattle horses on the ranch, but at times a most desperate and vicious bucker, and was a perfect heathen to break. I noticed that George watched him very carefully that morning when he mounted him by the stable door, but the horse seemed on his good behavior and walked quietly out through the gate—George still watching him, though. All at once, without the slightest provocation that I could see, he let a leap out of him as if he were trying to jump over a mountain. George's hat flew off, but George remained in the saddle, his knees pressed tightly against the bucking pads. And then the very demon of perdition seemed to fill the soul of that horse, and he plunged and leaped and struggled madly down the road as far as the blacksmith shop before George could check him. After he had his tear out he walked back quietly enough, except that the white of his eye still showed more than normal, and George reported that he behaved well the rest of the day. The name of this horse is Sharkey, and if his original namesake had possessed the agility, the stamina and vim of the horse, there would have been nothing further heard of Jeffries after that famous twenty-five rounds.

It took the boys all forenoon to round up the cattle, and as they came down the mountain side in one immense herd,, we could see little but a cloud of dust and hear nothing but the most incessant bellowing that ever greeted the ear of an unsophisticated cityite. They were driven into a big kraal and left to bellow till after dinner, which they generously continued to do. Before branding they were put in a smaller kraal, where the lasso could be used to better advantage. George stands just outside the gate in the big kraal with the other boys about him. Old Sing, the Chinaman, is outside the kraal with a fire to keep the branding iron hot. A couple of Indians on horseback ride in among the cattle and "lass" the calves. The instant the rope is over the calf's neck it is wound around the horn of the saddle and the horse drags the calf, bellowing, through the gate. There are four boys out with George and two of them instantly seize the calf and throw it, while the other two take the next one. George can brand as many as the two Indians and the four boys can handle for him. Tommy and Otty are not very old, and when they get hold of a lusty calf it is a spirited tussle to floor it. This is the hardest work I have seen on the ranch. In fact, it is a constant wrestling match the entire afternoon. Toward evening the boys are getting so tired that a fresh saddle horse is brought out to the branding kraal and employed to throw the calves by "lassing" the hind feet. It is a lively scene the whole afternoon, but I love best to sit on the top log of the kraal and watch the Indians throw the rope. They weave their horses in and out among the herd and with apparently no more effort than an ordinary individual would walk along the street they toss the rope over a calf's head and the horse does the rest. In all that medley of horns and heads I never saw them catch the wrong animal. After being branded the calves are turned loose by themselves in the large kraal, and the way they scamper off would seem to indicate that they are none the worse from having the tip of their right ear snipped off and the figure 12 seared into their hip.

Please remember that the incessant bellowing is being kept up by the entire herd—calves included. When the last calf is branded they are all turned together again in the big kraal, and then the blemished animals are caught, thrown and attended to. It may be an ingrowing horn that has to be sawed off, a big sack of synovial fluid on a knee that must be opened, or a bunch on the hide that must be cut away. The entire herd is inspected before being turned out, and it is quite late when all is done. Just at dusk, when the distant mountain peaks are becoming dim and hazy, and the coyotes are barking out among the timber, the herd is started toward the summer range, disappearing over a knoll in one immense cloud of dust and a prolonged and sonorous volume of bellow. It is very late when it gets dark in British Columbia at this season of the year, and this has been a long, hard day for the boys, but, true to the native instincts of cowboys, they are up early the next morning, riding the horses over the ranges as if nothing had happened.

(*To be continued.*)

DOMESTIC CORRESPONDENCE.

NEW YORK LETTER.

Dear Mr. Editor:

The regular monthly meeting of the Institute of Stomatology was held on the first Tuesday of January. The essayist of the evening was Dr. Eugene H. Smith, of Harvard Dental Department, his subject being "Extraction of Permanent Teeth, its Bearing on the Hygiene of the Mouth and a Proper Procedure in the Treatment of Some Cases of Malocclusion."

His paper was profusely illustrated with the lantern, showing many cases of irregularity corrected to the point of good appearance and usefulness, by extraction of several teeth before attempting to move the teeth. Most, if not all, the cases, however demonstrated the work from a clinical standpoint, and that which one might have expected from the paper's title, the relation of hygiene of the mouth to such extraction was lost sight of.

The discussion elicited nothing new—some siding with Dr. Smith that it was the proper thing to extract in many cases of malocclusion, and others agreeing with the modern school of orthodontists.

Under incidents of office practice Dr. Kimball spoke of a case of almost uncontrollable bleeding from a broken root. Dr. Bogue spoke of a plug of gutta percha as the most effective way of stopping the hemorrhage, and Dr. R. H. M. Dawbarn called the society's attention to "Glutole" as a new and efficient styptic and antiseptic.

The Second District Dental Society (the Brooklyn society) held its January meeting in the large room of the Kings County Medical Society's Library building to listen to a paper on "Gold Inlay Restoration of Bicuspids and Molars," by Dr. Joseph William Wassall, of Chicago, Ill. It was profusely illustrated with lantern slides, describing in detail each part of the work, so that anyone among us with even ordinary intelligence should be readily able to make a good gold inlay.

Dr. Ames, of Chicago, in discussion quite agreed in the main with the essayist. He spoke at some length on cements also.

Dr. Ottolengui said that some years ago he did not think much of gold inlays, but had changed his mind and now thinks them of great value. Spoke of having recently seen in the mouth of one of Dr. Johnson's patients (Dr. Johnson, of Chicago) a fine inlay with perfect edges and occlusion.

Dr. A. W. Harlan asked the question, "Do gold inlays preserve teeth better than fillings?" Also what is the difference in time between the two operations? Spoke of the absence of thermal change as one great advantage.

Dr. Jarvie, of Brooklyn, while never having made a gold inlay, was much impressed with their value, especially from the standpoint of the patient's relief from strain of long operation.

Dr. Herbert L. Wheeler said he thought gold inlays far superior to fillings. Spoke of the saving of nervous strain. Said their lasting qualities were far superior to gold fillings.

Dr. Wassall in closing said he had no use for gold filling instruments. Had put in no gold foil filling in two years. Said that it was just as easy to make an inlay for a small cavity as for a larger one. Has much of the work done by assistants, thereby saving time for himself.

The annual meeting and election of officers of the Odontological Society occurred in December. This meeting being purely business, had nothing of general public interest, except the good reports of the Society's condition, the work of the past year, essays, etc., and the election of new officers, resulting as follows: President, Dr. F. T. Van Woert; Vice-President, Dr. W. J. Turner; Recording Secretary, Dr. W. B. Dills; Treasurer, Dr. F. C. Walker; Editor, Dr. W. B. Dunning; Curator, Dr. C. A. Du Bois; Corresponding Secretary, Dr. Ellison Hillyer.

Brooklyn has always been credited with but one society, but from this array it makes of it a greater New York body, with its meeting place in the metropolis. The board of officers are all Brooklyn men, with the exception of Editor and Curator.

The December meeting of the Central Dental Association occurred on the 18th at Newark, N. J.

The essayist of the evening was Dr. Nelson T. Shields, of New York City. He spoke upon his method of rapidly and painlessly extirpating the pulp. He referred to the length of time needed in the use of arsenic—and cataphoresis, leading up to the use of pressure anesthetic.

He had found that by leaving arsenic in a tooth two (2) days he could extract the pulp by pressure anesthesia, but not *after* two (2) days because of the congestion. He had found that it took quite a little time to reach pulp from point of application of arsenic. He then tried to enter a tooth without application of arsenic and found that with patience and diligence he could do so, and can now give a definite means of reaching any pulp practically without pain. Said he had not yet had one he could not so reach.

Spoke of some cases where it was desirable to remove the pulp from an absolutely sound tooth. His method is as follows: He begins with a *small* bur, No. ½ or 1—a *round* bur—entering the palatal surface until the least bit of sensation. Then a No. 4 bur is used directly in same spot until sensitive place is reached. Then a *small* round bur is again used and held directly against sensitive spot, not with any pressure, but carefully holding it true on that little spot. The bur will advance without patient feeling it. After again reaching a sensitive spot, take a *narrow* excavator, go up into place where No. ½ bur entered, touch the tooth structure the least little bit with the excavator, and go right through into the pulp and so easily you hardly realize it. (Query, what of patient?)

With this exposure, in a very short time by pressure anesthesia, the whole pulp is anesthetized and can be torn to pieces. He does not remove the entire pulp without a further application of cocaine so as to be sure of entire absence of pain at apex. While he believes such a case is ready for immediate root filling he seldom does so, except in case of patients leaving town.

He then took up the subject of root filling. Ascertaining the depth of the root he places a little rubber indicator on the broach and then knows all through the operation exactly the length of the canal. When canal is thoroughly cleansed he takes a little piece of Abbey's No. 4 soft foil and carries it to the end of the canal. This, he says, can be done as easily as a piece of cotton, and the gold seals the foramen right at the apex, after which the canal may be filled with a material which will fill it perfectly even to the microscopical tubules in the root, and that material is oxy-chloride of zinc. In this way he claims one has a root filling "you may never expect to fail."

In the discussion Dr. B. F. Luckey said he was disappointed because he had come expecting to hear about the extirpation of the pulp *without* the use of anesthetics, as the program led him to expect. The use of cocaine for the anesthetizing of pulp was not new. Said it would be another proposition for him to open a solid tooth to the point of pulp exposure as painlessly as described by the essayist. Said that in some cases we could puncture the pulp before getting slightest sign of pain, but in many cases would be unwise, and thought long before reaching that point there would be marked indications of great discomfort. Advocated adrenalin chloride when such an exposure was made, to be followed with cocaine.

Referring to the question of root filling, he said "Every man is right according to the light he has and the results he gets; and what one man can do many another man can not do."

Dr. S. C. G. Watkins claimed to have used a similar method to Dr. Shields' for a great number of years. Thought that two days' application of arsenic should be long enough to enable one to remove the pulp without using any other anesthetic. Said he was the first to bring cocaine East and present it to New York societies and C. D. A. Said it was a conundrum to him how a man could reach the apical foramen with gold. Described his method of filling canals with a lead cone. Always opposed to the use of oxyphosphate of zinc, or oxychloride of zinc, or any cement.

Dr. Baker thought the method of exposing pulp with a small bur had been in use for a great many years.

Dr. Sutphen agreed with the essayist in the use of oxychloride of zinc for most canal fillings.

Dr. McLane said it was difficult for him to believe men when they said they could fill *all* canals perfectly; he could not do so. Said it was a mechanical impossibility to perfectly fill some very crooked canals.

Dr. R. M. Sanger, speaking again, wondered why, after such a clean cut and well defined surgical operation one should not *always* perform immediate root filling. He thought any other way would be to leave the canal in danger of infection.

In closing the discussion Dr. Shields said that he was much flattered to see that practically all agreed with him. Maintained that the filling of roots of teeth with gold to the apex was the simplest thing. Said he had seen a root with more than a half dozen apices and that all those ends must be sealed.

Tuesday, January 9th, was the date of the first meeting in the new year of the First District Society at the Academy of Medicine, Dr. A. L. Swift presiding. Under incidents of office practice,

Dr. Hess presented a patient, a girl about ten, whose teeth lacked enamel covering. The patient had come to him but a few days before, so he was not prepared to say as to the etiology or even the general history of the case. He did say that the family history seemed good; the child was apparently developing normally otherwise. Irregularity of the teeth was quite marked, especially in the incisor region. The teeth do not evidence any considerable caries, but are quite brown in color. In reply to his request as to the probable treatment to pursue, Dr. J. I. Hart suggested prophylactic measures, the use of alkaline mouth washes for the present and probably for a few years to come, but eventually to restore the missing tissue by means of jacket crowns (such as Dr. Spalding has elucidated). Dr. H. W. Gillett, too, thought that would be proper procedure and recommended further that radiographic pictures be made to ascertain the condition of the pulps.

Dr. H. Clay Ferris, of Brooklyn, suggested that orthodontive measures adopted at the present time would prepare the case for better treatment by porcelain restoration subsequently. The case provoked much discussion, which pleased the President.

It was quite late before the paper of the evening was reached. Dr. Nelson T. Shields, of New York, read an essay, entitled, "Pyorrhea and the Splinting of Loosened Teeth."

His contention is that pyorrhea is a "result" and not a disease, and it can be cured by local treatment. He believes that its primary emanation is due to some derangement of the nervous system.

Any undertaking which requires nervous strain will induce pyorrhea, such as the excitement of stock brokerage or proceedings for divorce. Prophylaxis is liable to be neglected at these times.

Dr. Shields termed the "nervous system the greatest of God's creations," saying that it dominated everything. "The treatment of pyorrhea also directed the treatment of the nervous system." His care of the disease is to mechanically cleanse the teeth as thoroughly as possible, then to bathe the sockets with aromatic sulphuric acid and a saturated solution of hydronaphthol, followed by the free use by the patient of mouth washes and Dobel's solution.

In loose teeth he believes the radical extirpation of pulps a necessity. He enters the pulp chamber with a bur as painlessly as possible, then uses cocaine pressure anesthesia. The pulp having been thoroughly removed he fills the apical end with gold, then the remaining canal with oxychloride of zinc.

"Some dentists extract loosened teeth, cleanse and replant. The extraction and cleansing of the tooth did not cure the disease, but the removal of the pulp did." In the cases in which Dr. Shields did the splinting he also devitalized the pulps in a healthy tooth either side of the affected ones, or as many teeth may be so treated as in the judgment of the operator is necessary.

As to the mechanical treatment—the splinting—an impression is taken, from which a metal die is made, upon which pure gold is swaged, covering the lingual surfaces of the teeth; this is placed in position in the mouth, holes are punched through the gold to the holes made for removing the pulps and filling the pulp canals, platino-iridium wire is placed into these pulp canals, waxed in place, removed and soldered, and the whole backing reinforced, except at the cervical margin, which is left soft for proper burnishing. The whole is finally fixed to place with oxy-phosphate.

"This splinting has given me a most satisfactory and permanent result."

Dr. Shields' subject was one of those that there is so much variance of opinion and procedure that it lent itself readily to discussion. If men had no homes other than society meeting rooms they probably would be there yet. It was much past eleven when a motion was made to adjourn.

Dr. John I. Hart was the first to take the floor. As always, he treated the subject from a conservative standpoint, saying: "I don't think I am as free in the removal of pulps as Dr. Shields evidently is. We jump to extremes. Some years ago we would hesitate to remove pulps under almost any consideration. Some, though, take the middle course."

He believes that there are predisposing and exciting causes of the disease. After all it gets back to faulty metabolism.

"The correction of the trouble would require that the patient lead a more natural life; out of doors exercise, drink plenty of water, a good system of hygiene; in other words, get back to the simple life." There is no question but that we can make a mouth healthy, and if not too much process is gone, make the teeth firm; otherwise use splints. His plan has been to splint the four loose incisors or such teeth as are affected, but not to sacrifice healthy pulps.

Dr. MaWhinney some years ago presented carbolic acid and sulphuric acid—pheno-sulphuric acid for the treatment of pyorrhea pockets, which Dr. Hart still thinks is a good remedy.

Dr. R. M. Hutchinson, of Brooklyn, spoke of Dr. Shields' idea of the etiology of pyorrhea as novel. In the disease there are some predisposing causes. It has been conceded generally that surgical treatment is the only treatment. When we say we have cured the disease we mean that we have removed the cause.

Dr. Hutchinson said he has never yet found it necessary to devitalize a pulp. Only ones he has found necessary to remove were putrescent pulps.

Splinting is only necessary where the alveolus has been so absorbed as to be non-supporting.

He then spoke of the ill effect some advice relative to the treatment of the disease had upon the young men. He asked them not to be discouraged by a confusion of ideas, but to work; work to clean teeth. His firm opinion is that if oral prophylaxis is followed faithfully, millions of teeth will be saved. His admonishment was very timely and altogether his remarks very proper.

Dr. H. C. Ferris, of Brooklyn, quoted from the more recent studies of Dr. Kirk and others as to the diathesis of pyorrhea, saying that the presence of carbon dioxide in the blood produced such chemical changes that the development and deposit of calculus was a sequence. His belief is that it is a constitutional disturbance amenable to local treatment, and that lymphatic and bilious temperaments are most frequently affected. The devitalizing of pulps in healthy teeth should be condemned. Even in the making of splints as few pulps should be sacrificed as possible.

Dr. Sauton spoke quite to the point about the recent researches of the medical profession relative to uric acid diathesis.

Dr. Gillett said pyorrhea reminded him of the old and much discussed problem as to which came first, the hen or the egg. Malnutrition and irritation he considers as the primary causes.

Dr. Hutchinson in speaking again answered Dr. Ferris, who made the statement that lymphatic and bilious temperaments were most susceptible to pyorrhea.

The president, Dr. Swift, said among other things that he prefers to keep pulps alive where he possibly can.

In summing up, Dr. Shields was not so harsh with those who differed with his view as he generally is.

"Why do I remove pulps? I't is the most natural thing in the world to remove what causes the disease in those teeth loosened, and the most humane thing to remove pulps from painful teeth."

Finally he said: "It is not always a local disease, but you can cure it permanently. You must, however, recommend entire change of the patient's life."

"The cause of pyorrhea is absolutely plain to me. It is due to disease of the nervous system."

THE BOROUGHS.

PRACTICAL HINTS DEPARTMENT.

EDITED BY G. W. JOHNSON, D. D. S.

[This department is for busy readers. We want short articles containing practical ideas—the shorter the better. No article must exceed 200 words, unless of exceptional merit. Every dentist has some useful hint that has been of value to him, and if he will only put it in print it may be of equal value to others. That is what this department is for. Due credit will be given for every article sent. Address G. W. Johnson, THE DENTAL REVIEW, 55 State street, Chicago, Ill.]

Suggestion:—Cultivate the magnifying glass habit in inlay work.—*Oliver Martin, Ottawa, Canada.*

Cementing Inlays:—I think for twenty years or more I have made gold inlays, and they have stayed as well as any operative work I ever did. There is a great deal in putting much force on the cement, and the less cement you put in the better.—*E. C. French, Eau Claire, Wis.*

Opening Large Cavities:—Employ a chisel and hand mallet to break down enamel walls. A slight tap will accomplish what would otherwise require much hand pressure, and without so much danger of the chisel slipping and injuring the soft tissues.—*Oliver Martin, Ottawa, Canada.*

Proximal Cavities:—When, in excavating a compound cavity in a tooth, you find a spot upon the next tooth, opposite the cavity, if the patient is young and the caries active, that should be cut out at once and the cavity filled. On the other hand, if the patient is comparatively old and one in whose mouth the progress of caries is stopping, I believe you are not justified in cutting it out. There is a difference in the conditions which must be taken into consideration.—*F. B. Noyes, Chicago.*

Preventing Dental Caries:—The best time to stop a cavity is before it forms. It has been said, "Micro-organisms attach themselves to the tooth surfaces," and that a further step is a slight roughening of the enamel surface, which roughening should all be cut away. If this slightly roughened surface be polished perfectly and *kept polished,* further steps of decay are impossible, hence cutting away is needless. Perfect polishing of the teeth and constant maintenance of the polish will make needless this vast waste of tooth structure in so-called vulnerable positions and even *prevent altogether* the formation of cavities.—*L. H. Arnold, Chicago.*

Gold Inlays:—It is unwise to subject children to protracted operations, and plastic fillings are not always desirable. The gold inlay eliminates many unpleasant features, and has proven to be a boon to suffering humanity. Many otherwise acceptable metal fillings are a constant source of irritation, owing to their susceptibility to the effect of thermal changes. The layer of cement under the hollow inlay protects the pulp to a great degree. Very many teeth are condemned to be cut off for gold crowns that might better be restored with gold inlays, and the gold inlay is well adapted to use as an abutment for a fixed bridge, or to hold an attachment for a removable one.—*W. G. Clark, Chicago.*

Milk of Magnesia in Pyorrhea Cases:—As an example of simple, continued medication in pyorrhea cases, we have the employment of so-called milk of magnesia, which is theoretically, and probably in reality, an antacid of considerable value. Let us suppose that occasion calls for a continued antacid effect within a pyorrhea pocket, and suppose that a paste of magnesium hydrate, the sediment of milk of magnesia, were available, which could be readily introduced to the extreme depth of this pyorrhea pocket. Is it not reasonable to believe that some of this paste would remain in position for several days and an antacid state be maintained until the last trace has been removed by chemical action or otherwise?—*W. V.-B. Ames, Chicago.*

Failure of Fillings:—There are many things that enter into the question of failure of fillings. Imperfect preparation of cavities is by far the largest factor in the problem. The dentist who practices extension for prevention, either in its extreme form or with modifications to suit the cases, can trace the recurrence of decay to faulty preparation. Possibly in order to avoid a display of gold or to save time—to save pain to the patient, or from laziness and a desire to do the easy thing rather than the best, a compromise was made. A compromise in most things of life only postpones the day of reckoning, and this is especially true in the preparation of cavities. —*W. A. Hoover, Gibson City, Ill.*

Molding Ring:—The Bailey flask, so generally in use for molding, is totally inadequate for the purpose. In the first place, a model should be shaped so as to drop from the mold, never to be lifted out. This means flaring of the sides all around. In cases where deep undercuts are present in front, set the model so that the anterior portion is higher than the rear and flare the model more on the rear. This being done, it is impossible to mold in the Bailey flask. A ring five inches in diameter and two and one-half inches deep meets all the requirements. Such a ring is sold by H. D. Justi & Son. For tamping use a small potato masher, paring off the knob on the handle for use at the sides.—*L. P. Haskell, Chicago.*

Disadvantages of Porcelain Crowns with Bands:—First, perhaps, in importance is the irritation resulting from the presence of the band underneath the free margin of the gum. Although the band may be fitted with great care, so that apparently there is no projection between the band and the root, and even though it be ever so thin, it acts as a foreign body and is a constant source of irritation, however slight it may be. If the band is fitted so as to be entirely under the gum, it is the observation of critical dentists that the band not only becomes visible after a short time, but more than that, at the point of junction between the band and the root there is a seat of irritation resulting in absorption and its sequelæ. It is not natural to have a foreign substance occupying the space between the free margin of the gum and the tooth.—*U. M. Richardson, Chicago.*

Color for Porcelain Inlays:—A difference in the character of the high fusing and the low fusing porcelains is a factor. The high fusing porcelain is a more translucent body than the low fusing. This makes it more desirable for teeth whose translucence is marked As a general rule, the low fusing porcelain is more desirable for labial cavities where the greater denseness is accompanied by a more decided opaqueness. Aside from this difference in porcelains two other features should be noted. First, we will gain much by using as large a body of porcelain as possible. Second, by using a white cement we will have a less number of light rays absorbed than is possible by the use of any colored cement, and if we adhere strictly to a cement of one color we shall become more expert in the use of our porcelains through always obtaining the same results. If these two points are carefully observed, I believe the operator will be materially aided in the production of an inlay of good color.—*C. H. Farrand, La Crosse, Wis.*

Definitions:—I submit a few definitions of words very commonly misused in essays and speeches printed in dental journals:

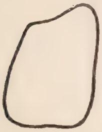
Drug—Any substance used in the composition of medicine.

Medicine—Anything applied for the cure or lessening of disease or pain.

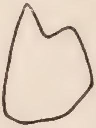
Remedy—Any medicine, appliance or treatment that cures disease; that which counteracts any evil or repairs any loss. The word *remedy* should not be used in the plural. Drugs and medicines may be bought, sold or kept in stock, but not so "remedies." The remedy for an alveolar abscess is a course of surgical and medicinal treatment; for a diseased and useless tooth extraction, etc. Carbolic acid, cocaine, arsenic, oil of cloves are *drugs.* When applied to disease they are *medicines.*

Treatment—The manner of applying a remedy, which may be surgical, mechanical or medicinal. The word is not properly used in the plural.—*W. C. Gowan, Creemore, Ontario.*

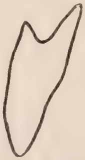
Peculiar Case:—The cuts illustrate the crown of an upper right lateral that was removed from the mouth of a girl thirteen years old. It will be noticed that the root is entirely absorbed and part of the enamel is gone. This young miss has been a patient of mine for eight or nine years and is a healthy, well developed girl. Her teeth are much above the average and well cared for. The deciduous teeth did not decay, but remained until the roots were absorbed and the permanent teeth ready to take their place in the mouth. About eighteen months ago the upper right temporary cuspid was extracted and it was found that the point of the permanent cuspid turned a little more than normal toward the lateral. A short time after, the lateral commenced to get loose and the cuspid continued to crowd upon it until the root was entirely gone. On the left side the teeth are further developed and each in the right place, but the lateral has commenced to get loose. I would like to know if the readers of The Dental Review can give a satisfactory explanation of this trouble, or suggest anything to prevent further loss of teeth.—*J. B. Williams, Ashland, Wis.*



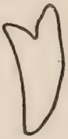
Labial Surface.



Lingual Surface



Mesial Surface



Distal Surface.

OBITUARY.

DR. CHARLES C. CHITTENDEN.

DIED: At Madison, Wis., on December 15, 1905, Dr. C. C. Chittenden, in his sixty-fourth year.

The death of Dr. Chittenden came as a profound shock to his many friends in the profession, few of whom knew of his serious illness. The following tribute is taken from *The Madison Democrat* of December 16, 1905:

Dr. Chittenden was born among the hills of Nunda, Livingston county, New York, May 10, 1842. His father, Nelson Chittenden, an old Vermonter, was born in 1806. The county of Chittenden in that State received its appellation from the family name. His mother, Sophia B. (Fuller) Chittenden, was a native of Springfield, Mass. The blood of good old New England stock flowed in his veins.

HALF CENTURY IN MADISON.

During the first thirteen years of his life Dr. Chittenden resided at the place where he was born. In 1855 he came to Madison. His father had preceded him to this State, believing that he saw great possibilities in the western country.

Early in life Dr. Chittenden showed an inclination toward the profession of dentistry. This was the chosen work of his father, whose skill and efficiency will be remembered by many of Madison's older residents. The son inherited the father's ability, and, also, his strong personality.

In 1866 Dr. Chittenden was graduated from the Ohio College of Dental Surgery at Cincinnati, and he was also a student at the Miami Medical College in Ohio.

Professional fellow-workers of Dr. Chittenden were quick to recognize his ability in dentistry. He served as president and chairman of the committee on colleges of the National Association of Dental Examiners. In 1885, when the State Board of Dental Examiners was created by law, Dr. Chittenden was appointed a member of that body, and with the exception of two years, has served continuously as its president. He was also president of the Madison Odontological society, and one of the honors which lately came to him was the presidency of the National Dental Association. He was elected to that office at the national convention at Asheville, N. C.

Dr. Chittenden was a man of genial disposition, which won for him a wide circle of friends. In days gone by his love for amusement often led him to take part in many private theatricals in Madison, and when holiday time came around he often assumed the role of St. Nicholas at Christmas festivities. Even after he had passed the three score mark there remained a keenness and a brightness in his eyes which advancing years did not dim. Time sprinkled a tinge of gray upon his head, but it never touched the youth and lightness of his heart.

Dr. Chittenden was a member of the Masonic Order of the Knights Templar rank.

Dr. Chittenden was married on May 18, 1867, to Miss Virginia Carr Winter of New York. She died on the 5th of March of the following year. He is survived by three sisters, Mrs. Flora E. Devendorf of Berlin, Wis.; Mrs. L. C. Stewart of Waupun, and Miss Kate A. Chittenden of this city.

In respect to the memory of Dr. Charles C. Chittenden the Odontological Society of Madison adopted the following resolutions on December 16th:

WHEREAS, The hand of Providence has removed from us our honored member and President, Dr. Charles C. Cittenden, and

WHEREAS, In his decease we have lost one of the founders of our Association, who as President and as an active member until his death, evinced a warm interest in its welfare. As President of the National Dental Association, President of the National Association of Dental Examiners, and also President of the State Board of Dental Examiners for many years, he gave freely of his time and energy, sacrificing his health for the advancement and betterment of dental education, and who in many years of practice set before us a worthy example of fidelity to his patients, and kindly interest in his younger professional brethren; therefore, be it

Resolved, That we desire to express to his bereaved family our sympathy and sorrow in their affliction and our admiration for the professional and personal qualities of our member; and

Resolved, That these resolutions be spread upon the records of our Association, a copy sent the family of our departed brother, and others to the dental journals for publication.

W. H. MUELLER,
O. C. SCHMEDEMAN,
F. T. MCCONNELL,
Committee.

DR. MILTON H. CHAPPELL.

DIED: At his home in Knightstown, Ind., December 15, 1905, Dr. Milton H. Chappell, from a stroke of paralysis which he suffered the Sunday morning preceding his death.

Dr. Chappell was born near Liberty, Indiana, August 20, 1841. He leaves a widow, three sons and two daughters to mourn the loss of a faithful husband and father. Dr. Chappell at one time filled a professor's chair in the Indiana Dental College and was prominent in dental society circles. He had practiced dentistry for forty years in the office rooms which he occupied at the time of his death. He was a prominent Odd Fellow, being a Past Grand Master of the Grand Lodge of Indiana.

S. F. D.

DR. CHARLES PERRY DEMING.

DIED: At Ashland, Wis., of heart disease, on Christmas morning, 1905, Dr. C. P. Deming, aged 43.

Dr. Deming was one of the most prominent dentists of his section of the country and was universally esteemed by all who knew him. He was graduated from the Chicago College of Dental Surgery in 1887 and had practiced in Ashland ever since. THE DENTAL REVIEW extends sympathy to his family and friends.

D. HOWARD CROUSE.

DIED: In Chicago on January 3, 1906, Mr. D. Howard Crouse, editor of the *Dental Digest,* and elder son of Dr. and Mrs. J. N. Crouse.

The death of Mr. Crouse was a profound shock to his many friends. He had been ailing for some time and had planned going away for rest and recuperation, but a sudden turn for the worse kept him home and he steadily failed until the end. He was only thirty-two years of age, but had developed great executive ability, and in addition to his editorial duties was manager of the Dental Protective Supply Company. He was a ripe scholar and thoroughly devoted to high ideals—his home life appealing to him more than to most men. His death is a serious blow to his immediate family, and his business associates. To his father, Dr. Crouse, the loss is well-nigh irreparable. Dr. Crouse had naturally grown to rely much on his son's judgment and business acumen, and the bereavement is therefore to him doubly severe.

THE DENTAL REVIEW extends its sincere condolence to the stricken family, and particularly to the father, who today is facing the saddest experience of his life.

MEMORANDA.

STATE BOARD APPOINTMENTS.

Drs. J. W. Penberthy and J. R. Conway have been appointed on the Minnesota State Board of Dental Examiners.

DENTAL EXHIBIT.

On March 27, 28, 29, 30, 1906, there will be held at the Auditorium, Chicago, the largest exhibit of dental goods and appliances ever attempted. There will be no papers, but experts in every line will give continuous demonstrations. No admission fees or dues. This is an exhibit by the manufacturers for the dentists and all are invited to be present. Particulars in the advertising pages.

ONE IN A THOUSAND.

It is seldom that a dentist makes money in mining but Dr. W. A. Heckard, of Indianapolis, seems to be an exception, and he has our congratulations. He was in Chicago a short time since with his pockets full of gold nuggets from his mine in Mexico, and the fact that his dental practice is for sale seems corroborative evidence that he is indeed one of the fortunate few.

THE BARNES DENTAL COLLEGE.

St. Louis, Mo., Jan. 8, 1906.—On account of the refusal and alleged financial inability of the board of trustees of Barnes University, St. Louis, to furnish the dental department of that institution with demonstrators necessitated by the requirements of the Missouri State Board of Dental Examiners and the National Association of Dental Examiners, and with the apparatus and equipment necessary for the proper and legal teaching of dentistry (such as electric current, nitrous-oxide gas apparatus, etc.), Drs. B. L. Thorpe (dean), D. O. M. Le Cron (vice-dean), Richard Summa, Val H. Frederichs, W. F. A. Schultz, C. O. Simpson (secretary), E. E. Haverstick, E. P. Dameron and W. Y. Eckhart, of the dental faculty resigned December 16th, the resignation taking effect December 23, 1905.

B. L. Thorpe.

RECENT PATENTS OF INTEREST TO DENTISTS.

805,171. Artificial tooth, Emory L. Townsend, Los Angeles, Cal.

805,733. Toothbrush, Eduardo W. Key, Southwest City, Mo.

805,974. Manufacture of roof dental plates, Peter J. Malone, Altoona, Pa.

806,034. Artificial tooth fastening for bridgework, Thomas H. Whiteside, Youngstown, Ohio.

806,345. Suction attachment for dental plates, John A. Johnson, Middletown, Del.

806,300. Dental ligature applier, James Sorenson, Neenah, Wis.

807,620. Mercury and amalgam separator, Henry J. Horstmann, Fort Wayne, Ind.

Copies of above patents may be obtained for ten cents each by addressing John A. Saul, solicitor of patents, Fendall building, Washington, D. C.

THE G. V. BLACK CLUB CLINIC.

The G. V. Black Dental Club of St. Paul, will hold its annual midwinter clinic at the old capital building in St. Paul on February 22 and 23, 1906. An unusually interesting program is being arranged by the program committee. There will be all classes and kinds of dental operations, such as gold and amalgam fillings, porcelain and gold inlays, gold and porcelain crowns.

Such well known men as Drs. Searl, Clack, Beemer, Lewis, Moyer, Wells, Bond, James, Gallagher, Richardson, Conzett, Robinson, Pherrin, Crandall, Work and others will operate.

Dr. Truman W. Brophy, of Chicago, will make a surgical operation. Essays will be read by Drs. G. V. Black, C. N. Johnson and T. W. Brophy, of Chicago, Alfred Owre, of Minneapolis, Minn., and Conzett of Dubuque, Iowa.

There will be a number of table clinics of more than ordinary interest. Special attention has been given the exhibits.

Railroad rates one and one-third fares plus 25 cents, certificate plan.

The profession generally is invited to attend. For further information apply to R. B. Wilson, secretary, 107 East Sixth street, St. Paul, Minn.

BOARD OF DENTAL EXAMINERS, STATE OF WYOMING.

The laws regulating the practice of dentistry in Wyoming and the rules of the board are essentially as follows:

An examination is required of all applicants and only holders of diplomas from reputable dental colleges are eligible to such examination.

No dentist can begin the practice of his profession in this State without first making application for an examination to the secretary of the board, and at the same time paying the examination fee of twenty-five dollars and submitting his diploma for inspection.

The applicant will then be examined at the next meeting of the board, and if he passes a satisfactory examination a license will be issued to him. Until he receives this license he is not authorized to begin practice, and no license can be granted under the law except at a regular meeting of the board.

The possession of a diploma in itself gives no right to practice in this state.

One examination is held annually the first week in September of each year. The time, date and place are set by the board. All applications must be completed and in the hands of the secretary thirty days prior to the time set by the board for examinations to begin.

Besides the written examinations, each applicant must come prepared to do any practical work which may be required.

For further information and application blanks, address Peter Appe. Jr., secretary, P. O. Box 643, Cheyenne, Wyo.

DR. GUERINI'S HISTORY OF DENTISTRY.

The Committee on Dental History of the National Dental Association, is sending out the following circular letter, and we cordially commend this matter to the attention of the profession. We are informed that this history is most satisfactory, and it is important that its publication be facilitated in every possible manner. If further particulars are desired write the chairman of the committee:

Dear Doctor—At the Buffalo meeting of the National Dental Association the Committee on History of Dentistry reported to the association that Dr. Vincenzo Guerini, of Naples, Italy, had written a History of Dentistry from the earliest times down to the beginning of the nineteenth century, which work is in the hands of the committee, having been translated into English and fully revised and edited. Dr. Guerini has generously placed the publication of this great work under the patronage of the National Dental Association in token of his appreciation of American dental development. In order that the work may be published without financial loss it is necessary that about 700 subscriptions for copies at $5.00

each be obtained before contracts for printing, binding, and publishing the work can be entered into, and the duty of securing these advance subscriptions has been assigned to the Committee on History of Dentistry of the National Dental Association.

The committee believes that the general and growing interest in the history of our profession is a sufficient warrant for this undertaking. Our historical records are scattered through a vast literature and much of it is of great antiquity. These data have never before been gathered together and arranged in a consequential logical order. Dr. Guerini has spent many years of his professional life and large amounts of money in the collecting the material for this work. It has involved the searching of libraries and museums, the translation of many old documents and publications and the digesting and arranging of this matter into proper form. As a historical writer the distinguished author needs no introduction, as his contributions on dental history in our magazines are well known and their excellence is an earnest of the excellent and exhaustive character of his larger work now in the hands of the Committee on History of Dentistry for publication.

The importance and value of dental art and science as a humane service is well recognized, but we are so accustomed to view this question from the modern standpoint that we, generally speaking, overlook the immense work done by our predecessors, reaching far back in unbroken line to the mists of antiquity. It was they who laid the foundations upon which modern dentistry has been built and no man can peruse the record of their efforts as set forth in Dr. Guerini's book without developing a higher appreciation of their work and a keener realization of the worth and dignity of the calling which they in common with ourselves followed.

It is the desire of the committee having this matter in charge to secure as promptly as possible the subscriptions necessary before the work can be published. We ask you to consider this as a personal appeal, to fill out the enclosed blank and forward with or without your remittance to Dr. Charles S. Butler, The Frontenac, Buffalo, N. Y., who, with the treasurer of the National Dental Association, Dr. V. E. Turner, Raleigh, N. C., will act as custodian of the publication fund. Announcement will be from time to time made in the dental journals of the growth of the subscription list and the progress of the work of publication. The sooner the required 700 names are obtained, the sooner the work can be issued. The volume, it is estimated, will comprise about 500 pages. It will be profusely illustrated, and bound in cloth.

In case this proposed publication meets with the success which it merits a second and companion volume, treating of the more modern aspect of dentistry, will probably be issued under the same auspices and conditions.

EDWARD C. KIRK, Philadelphia.
WM. H. TRUEMAN, Philadelphia.
GORDON WHITE, Nashville, Tenn.
H. L. AMBLER, Cleveland, Ohio.
JAS. McMANUS, Hartford, Conn.
J. Y. CRAWFORD, Nashville, Tenn.
A. H. FULLER, St. Louis, Mo.
S. A. FREEMAN, Buffalo, N. Y.
W. E. BOARDMAN, Boston, Mass.
CHARLES S. BUTLER, Buffalo, N. Y.
BURTON LEE THORPE, Secretary,
St. Louis, Mo.
CHARLES McMANUS, Chairman,
Hartford, Conn.

THE

DENTAL REVIEW.

VOL. XX. CHICAGO, MARCH, 1906. No. 3

PRESIDENT'S ADDRESS.*

BY DR. J. H. WOOLLEY, CHICAGO, ILL.

My paper will be as brief a résumé of our Society's yearly work as I can give.

Six papers have been delivered; the first by Dr. G. W. Cook, subject "Some Pathological Phases of Alveolar Abscess." Dr. Cook says chemical investigations have shown that when certain pathological conditions arise micro-organisms have invaded the vascular tissues. Up to the present time my observations have led me to believe that there has not been found a specific bacteria that has produced the phenomena usually designated as inflammation and suppuration. When local infection occurs, the first degenerative action shows itself in a particular part of the body or locality. Where this infection is first established, micro-organisms being found in large quantities in a putrescent pulp, a number of chemical changes take place. The result of this chemical action can be liquification of the tissues and complete cellular death (Necrosis). He further says we can not interpret phenomena of tissues like that of the circumscribed area around the apical end of the root. If so, it could be said that it was conservative in its tendencies and benign in disposition and usually circumscribed because of the carefully protected mechanism of the tissue element in that locality.

Hyperaemia, a stage of inflammation, dilutes and always acts as a solvent on the irritating substances with a tendency to remove or better the poisonous products and establish a phagocytic property which enables it to destroy the micro-organisms present and dilutes their product, rendering them less harmful unless coming in contact with a lifeless pulp, and if so, poisoning to the end of the root.

---

*Read before the Odontological Society of Chicago, November, 1905.

If it remains there a little time it becomes virulent to such a degree as to cause degeneration of the tissues and afterwards pus, and more often takes upon itself a chronic form of inflammation.

The paper was discussed as follows:

DR. CASE:

Dr. Cook has given me a clear idea of the subject—about the best I have ever received.

DR. HINKINS:

Raised the question as to whether bacteria caused the diseased condition of the tissues, or a chemical change taking place? He said technically toxin was considered neutral, but chemists advanced the idea that they were poisons, taken up by the blood and distributed throughout the system. If there is any cause for irritation, oxygen is carried to the blood, and by these higher compounds and deposits break down the cell structure, or regenerate the protoplasm cell.

DR. TENNEY

Believes such papers help the dentist in arriving at correct methods.

DR. JOHNSON

Was much interested to know why, upon opening up a tooth (the pulp being lifeless) trouble frequently occurred.

DR. COOK,

In answer to Dr. Johnson, said he had found aerobic germs to become anaerobic and intensely pathogenic by extracting oxygen from their surroundings. No matter what kind of healing agents are used, it forces the germs through the ends of the root.

JANUARY, 1905.

Paper by Dr. Hinkins, "What Shall the General Practitioner Do With the First Permanent Molar?"

He believed no set rules could be observed, that many considerations entered into the problem. What are we going to do when the teeth are soft, badly decayed, with pulp exposure and crowded arch? He has extracted one or more of the first permanent molars and the result has been satisfactory as far as occlusion, integrity of the arch and well being of the patient are concerned.

In the discussion which followed,

Dr. G. W. Cook

Believed in Dr. Hinkins' mode of practice and that you can not lay down any set rules. All phases of the case must be considered.

Dr. J. G. Reid

Believed with the essayist, that each individual must settle the question of saving or removing the first permanent molar.

Dr. Perry:

There are eight teeth in the mouth I guard with jealous care, the first permanent molars and cuspids. When the pulps of the first permanent molars are exposed and the child is the other side of 12 years, I arrive at the question whether to treat them as temporary teeth and extract. I frequently remove one, but never yet consented to extract the other three.

Dr. Carpenter:

I was educated to save the first permanent molar. Dr. Hinkins' experience, judging from his models, has caused me to wobble in my opinions.

Dr. Case:

I believe the most vital question is protrusion and occlusion. In protrusion occurring in the upper or lower teeth, there would be some excuse for removing the first permanent molar. Many propositions confront us. If saved, what is the occlusion? Is it normal?

Dr. Ames:

Having had my child patients well in hand, I have been able to save most of the first permanent molars. I try to keep them by nursing them along until the eruption of the second molar.

Dr. Hinkins:

In closing the discussion, I believe the health of the child is more important than the dento-facial conformation.

Dr. L. L. Davis'

Read an essay, "Questions Concerning Pyorrhea."

The doctor raised the question, in opening up the subject, is this disease on the increase? Five years' experience and familiarity with the subject convinced him that it was. He believes, however, that inoculation and infection plays a more important part than heredity. Care and attention to the teeth are more beneficial than systemic treatment. Is it advisable to retain loose teeth where absorption of the gums has occurred, by ligatures, or bands, though retained without discomfort to the patient? This question needs careful consideration before reaching a decision. Is implantation desirable in cases of young persons who have lost anterior teeth by this disease? He has found replantation a failure in a tooth affected by pyorrhea.

The following points were brought out in the discussion:

DR. CARPENTER:

Judging from my clinical experience I am convinced pyorrhea is hereditary and at its early stage amenable to treatment. After careful instrumentation in four-fifths of my cases, I have discovered serumal calculus by inserting a thin, narrow chisel through the gingival space on the proximal side of the roots.

DR. HINKINS:

I do not know whether pyorrhea is hereditary or communicable. I found local medication a failure and have not subjected these cases to local medication for five years. I favor celluloid to retain these loose teeth in position.

DR. TENNEY

Believes it is almost a hopeless task to remove some serumal deposits.

DR. COOK:

It is a conceded fact that disease is not inherited in the strictest sense, only a predisposition to a disease. We know from the best authorities, notably Koch and the other investigators who have devoted their lives to a study and investigation of infective diseases, that they have established in their minds that there are degrees of inheritance, of susceptibility, or a predisposition may be acquired.

For instance, a man who indulges freely in the use of alcohol is more susceptible to pneumonia. I believe pyorrhea is not on the increase. Unless the dental investigation leads to the etiology of the disease, our talk formulates nothing. I doubt pyorrhea being infectious or inherited.

DR. C. N. JOHNSON:

I believe pyorrhea is on the increase. Many teeth are lost by disease other than true pyorrhea, simply by the recession of the gums. There is no pus indicated in these cases. I believe there is needed a better classification of these diseases that cause the loss of teeth. In some cases I believe the disease a purely local one.

DR. T. W. BROPHY

Recommended a better nomenclature. Pyorrhea means only the flowing of pus. Dr. Senn's nomenclature would be alveolitis, an inflammation of the alveolar process. I would call it dental alveolitis.

DR. PERRY:

The successful treatment of pyorrhea depends largely upon perfect instrumentation. I ameliorate, but do not cure.

DR. DAVIS,

Closing the discussion, said his paper simply dealt with conditions and what should be done in those conditions. He did not discuss methods, medicine or anything else regarding the cure of pyorrhea. He does not believe in extreme systemic medication, and does not care to combat the hereditary theory, but believes it to be a predisposing factor, and Dr. Cook bears him out in that particular.

"Hygiene of the Mouth," by Dr. J. H. Wassall.

He says the human teeth are menaced in their integrity by two pathological principles, dental caries and pyorrhea alveolaris, whose origin, to his belief, is brought about by micro-organisms of the mouth. In view of the facts above stated, the profession at large are alive and awake to the importance of the subject. He goes on to show in what manner colonies of bacteria grow in the mouth, aided by its warmth, pabulum, culture media. Practical observation will show that mechanical disturbances of the conditions favorable to bacteria in the mouth twice in twenty-four hours is sufficient to prevent any evil effects from their presence. His observation bears out this view.

He believes it important that dentists should impart to their patients all the conditions arising that are favorable to disease and decay, and emphasizes the necessity to look well to the hygiene of the mouth. He refers to the tooth brush and the importance of its correct use, and that so few patients give evidence that this has been properly attended to. It leads to higher things. He makes the point that in instruction to patients one should never say "brush the teeth"; say "brush the gums." If the latter is attended to sufficiently the teeth will take care of themselves. If there is tenderness and a tendency in the gums to bleed, brush gently for a few days, even using a soft brush, until they are toughened. Brush the parts that bleed easily with cold water until the bleeding is checked. If the gums continue to bleed, some deposits may be found. Philosophy of brushing, in conclusion, to use his own words: "The fluid with which the brush is saturated is pumped through the spaces between the normal teeth at each sweep, thereby dislodging any food, debris or bacterial growth. The brush pressure upon the slightly elastic or compressible gum tissue gives a pumping motion to the interdental gingival projection, which he believes is responsible for the peculiar efficiency of this method." In discussing this paper,

DR. BROPHY

Believed that hygiene or prophylaxis is the most important subject today and is so considered by those who have to treat disease. The mouth being the great center of infection, if we can succeed in making it aseptic much will be accomplished in the prevention of disease. He calls it bad practice to treat disease of the stomach, nervous system, or any disease of the body, without attending to the condition of the mouth. He referred to the Diamond Match Company as having a regularly employed dentist whose duty it is to look after employes as regards the hygiene of the mouth.

DR. TENNEY

Referred to the importance of oral hygiene and laid emphasis on the necessity of dentists instructing their patients how to care for their teeth and the manner of brushing same, though he has found it a very discouraging work.

DR. J. G. REID,

In referring to this subject, believed in the old Biblical quotation, "the saving of one soul is something." If you have made one person out of a hundred follow your advice regarding prophylactic measures, you have accomplished something.

DR. HINKINS

Refers to antiseptic solutions and mouth washes as being a great detriment to the keeping of the mouth and gums in a state of health. For the last five years he has condemned the use of H_2O_2 or some other mouth washes because he had found such bad results.

DRS. L. L. DAVIS, ROYCE, JOHNSON AND WOOLLEY'S

Remarks were an endorsement of Dr. Wassall's line of thought, and expressed in substance about what the rest have remarked on oral hygiene.

DR. WASSALL

Closed the discussion with some general instructions to patients. Examine the patient's teeth as to cleanliness and whether the gums are spongy and likely to bleed. Inquire as to brushing and the manner of same.

"Pulp Extraction, Consideration of Methods Employed and Its Accomplishment." By Dr. J. G. Reid.

His long experience warrants him in giving the greatest consideration to arsenic in the devitalization of the pulps in teeth when necessary, and he believes it superior to all other methods, even the latest process (cocaine pressure), and notwithstanding all, both old and new methods, and the advantages of the best information obtainable upon the subject, that there is no straight and narrow path leading to the promised land—Success. He refers to the different methods of pulp devitalization, such as soaking a wooden wedge with phenic acid and driving it into the pulp canal, freezing the pulp, cataphoresis, pressure anesthesia, devitalizing with arsenic or other agents. He discussed the two most common methods, *i. e.*, arsenic treatment and cocaine pressure. He says the arsenic method has been criticized and particularly by one who stands high in dental circles, but he believes if the necessary precautions are taken in the management of arsenic and intelligently observed no direful results can occur in the apical region, unless by instrumentation in forcing this drug to that locality. The danger in its use is in making the second application into the canal of the tooth and with a broach forcing some of the arsenic toward the apex of the root. The second application being repeated to further destroy that portion of the pulp tissue toward the apex of the root where the first application failed. In the management of arsenic, then, he says he is of the opinion it is a case of malpractice to place the arsenic beyond the entrance of the pulp canal, for therein lies the danger of arsenical poisoning. He emphasizes the importance of removing the devitalized pulp in its entirety, regardless of any other method we may adopt. He formulates his method as giving the most satisfactory results. First, to use his own words, see to it that the cavity of decay is freed from all foreign matter contained therein, also that the pulp be restored to as near a normal condition of health as it is possible to have it. Apply the rubber dam, dry the cavity, place the arsenic preparation in direct contact with the pulp, seal the cavity with any material that will absolutely insure the confinement of the arsenic, and allow it to remain in the tooth from four to six days. Upon the return of the patient at the end of that time, apply the dam, remove the arsenic, open up the pulp chamber, relieve the engorged blood vessels, after which thoroughly dehydrate the pulp by use of absolute alcohol. Reseal the cavity and allow it to go ten days or two weeks or such an interval of time as will insure sloughing of the tissues. At the appointed time for the removal of the pulp, apply the dam as before, dehydrate with alcohol. By this process the pulp will lessen its caliber and toughen in its tissues and can be removed in its entirety with no hemorrhage or weeping of blood serum. The doctor believes the arsenic is self limiting in its action; otherwise, through the medium of the circulation, direful results would follow its use.

Referring to cocaine and the cataphoresis process, comparing its results with the use of arsenic, more favorable results have been proven in the latter than in the former (cocaine and cataphoresis). He refers to hemorrhage occurring from the pulp in the use of cocaine, which is a grave consideration; though hemorrhage may be arrested, yet a clot of blood remaining at close contact at the end of the root or within the canal, is a fruitful soil for microorganisms. He refers to the anatomy of the roots of the teeth; because they are not cylindrical externally and internally, the proposition to remove all pulps is untenable, from an anatomical standpoint.

Discussion followed, with favorable comments on the soundness of the doctor's paper. Theoretically and practically nothing seems impossible in these days of modern science. If the dentist of four or five decades past could be resurrected and see what is now doing in this direction by the modern dentist in avoiding disease and in some cases death, it would seem to them an impossibility. If they could see what ether has done for relieving the severity of an operation, and the X-ray in dental diagnosis, they would exclaim at the greatness of modern science. Someone has forcibly written the following words: What a wonder the X-ray is in diagnosing the changed or altered size of the heart, the examination of the interior cavities of the body, radium treatment of cancer, the victory of the medical means used in appendicitis, handling typhoid, treating of Bright's disease, surgery of the heart, operating on the brain. The science of dentistry has kept pace with that of surgery, yet I believe much more could be accomplished if some capable scientist could devote his entire time in research work, such as the etiology of dental diseases. Dr. Reid put it forcibly at one of our meetings when he said, "Unless the dentists' investigations lead to the etiology of disease, our talks formulate nothing. We have not at present any one of independent means who can give his entire time to research work. What can we do in this direction, in providing funds for this purpose?" Much of my résumé has been excerpts of the papers read by members of the society.

THE DENTAL REVIEW will please accept acknowledgments for valuable references in getting the material for my annual address.

THE POSSIBILITIES OF A PROFESSIONAL CAREER.*

BY C. N. JOHNSON, M. A., L. D. S., D. D. S., CHICAGO, ILL.

Every man has within him the impulse to achieve something of note in the world. However lacking in ambition he may seem there is somewhere in his makeup a hidden spring which, if properly touched, will reveal a desire to do something great. It is true that in many individuals this spring seems well-nigh inaccessible, while in others, though the impulse is evident, there is not sufficient energy to overcome the inertia of circumstance or habit. Above all things there is lacking in too many people the one prime essential to achievement, viz., the patience to persevere in the face of difficulties. Brilliancy will often fall short of high attainment where aility of a lesser order will succeed through the sublime attribute of plodding.

---

*Read at the annual clinic of the Alumni Association, Chicago College of Dental Surgery, January 17, 1906.

After all the nature of a man's calling matters not so much; the same characteristics, so far as the fundamentals are concerned, count for or against achievement in any walk of life. It is true that in the details there is a wide variance in the order of ability required for high attainment in different pursuits. A successful merchant might not have been a successful lawyer; a successful dentist might not have been a successful real estate man, and yet the merchant, the lawyer, the dentist and the real estate man must possess some of the same fundamental characteristics in order to be successful.

But it has sometimes seemed to me that there were possibilities in a professional career which if a man availed himself thereof would lift him into a higher plane of thought and action than that of the man who follows a strictly commercial pursuit. Not that the commercial man may not be an altogether important and necessary member of society. Not that there is the slightest suggestion of reproach against either the man or his calling, but that the truly professional life brings a man into more intimate relationship with his fellowmen and places his responsibilities and obligations upon a higher plane. The ethics of professionalism are different from the ethics of trade, and while it is true that the general advancement of ideals in modern life brings the ethics of commercial pursuits very nearly on a par with what professional ethics formerly were, yet professionalism has always gone far in advance of the trades in ideals. This would seem to imply that ideals of life, both professional and commercial, are higher today than formerly, and in face of the generally conceived opinion that such is not the case, I am firmly convinced that it is. It may be argued that recent exposures in connection with trust abuses and insurance scandals would go to prove the utter deterioration of moral rectitude and the absence of ideals of any kind, but I argue that it is an unerring indication of a healthy advance in ideals. The very fact that these abuses have been exposed is proof positive that the people are contending for the principles of higher ethics and greater equity in commercial relations. Time was, not long since, when abuses of this sort were allowed to go on and did go on indefinitely without interference, and conditions which we today are seeking to ameliorate were considered inevitable. The one single discouraging feature of the recent investigations just referred to, aside from the wanton extravagance of high officials which everybody had all along suspected, was the attitude of the daily press. The hysterical clamor and distortion of facts in some of our press reports were not only a serious breach of ethical standards, but a real disgrace to modern journalism and an offense to common decency. Even the old staid Associated Press was not entirely guiltless in this respect, and in passing let me say that the next great reform that is needed in society is the purification of the press, and the suppression of some of the vile sheets which are hawked about the land to the utter abandonment of everything respectable or decent. One such sheet circulating in a community and pandering to the most depraved tastes by nauseating details of immorality and crime can do more real harm to the social fabric in a single twelvemonth than ever was or ever will be done by all the trust and insurance abuses ever perpetrated.

But the purport of this paper will not admit of as full a consideration of this subject as I could wish. What I want to emphasize is the fact that I believe society on the whole is improving and that ideals are higher today than ever. If this is true it must follow that the professions are advancing, and this advance leads us to the consideration of the possibilities of a professional career. In all those activities of life where men strive to attain something of note—something which shall give them a vital relationship with their fellowmen—there is no field more fruitful than the professions. It is true that of some professions it must be said that the breadth of possibilities is greater than others, the horizon is wider, and yet when all is considered it will be found that the penalties and compensations as represented by the responsibilities and remunerations, strike a very even balance when the sum total of desirability is weighed.

A lawyer, if a man of ability, makes a greater impress on public opinion than a dentist and reaps a larger financial reward; a minister sways the multitude and enters more vitally into the motives and aspirations of mankind; a physician or surgeon has a wider field of effort and attains to a greater brilliancy of achievement if successful; and yet each of these has his tribulations. A lawyer is brought face to face with all the scheming, the meanness and rascality of which the worst types of humanity are capable. He is also subjected to the most trying temptations to wrong doing of all sorts from bribery to blackmail. He is dealing continually with the baser impulses of humanity, with chicanery, dishonesty and deceit, and this kind of a life is apt to warp a man's judgment, to make him suspicious, and interfere with those high ideals which should be the ultimate aspiration of every individual.

This was never more vividly impressed upon me than when a few years ago I was sitting on an arbitration case with a lawyer of this city. After discussing the case at some length from every possible point of view and then failing to agree, he finally, in a burst of confidence said to me: "Doctor, I want to do you the honor of saying that you impress me as being one of the fairest minded men I ever met, and I also want to acknowledge that I do not think I am altogether a suitable man for an arbitrator. Being a lawyer I do not suppose it to be possible for me to be anything but a partisan. I am sure it is not your fault that we have not agreed and under the circumstances I do not think it is my fault, and I suggest that we refer the case back to the originals."

Gentlemen, in all earnestness, if I was a member of a profession the practice of which forced me to acknowledge that I could not be fair minded, and that I must look on only one side of every question simply because it was my side I should get out of that profession tomorrow. But let me hasten to say that to the honor of the leading lights of the law I can hardly accept this gentleman's attitude as a fair index of the higher ethics of the profession.

A minister, though apparently a dominant force in his community, is after all nobody's dictator, not even his own. He is the prey of every bit of petty gossip, the butt of all criticism, and often the subject of slander. He is held accountable to the narrowest-minded of his flock, and his every act is scrutinized as if he were the common property of his parishioners. Not only this, but his tenure of office is subject to the whims of those who employ him, and his emoluments are usually not great enough to make him independent. In fact he is the servant of a hundred masters, some of whom are certain to be hard to please.

The physician—well, I have the profoundest respect for the honest practitioner of medicine. There is no higher calling, to my mind, in all human endeavor than the amelioration of suffering, and yet I would not exchange places with the medical man, even if I could. When I think of the responsibilities, the perplexities, and the trials of the average practitioner of medicine; when I think of the obscurity of some diseases, the difficulties of diagnosis, and the uncertainty of treatment; when I think of the dilemmas and the disappointments, I am thankful not to be called upon to encounter them. Dealing with the intricate issues of life and death is a most serious business, particularly when many of the factors in the case may be wholly beyond the physician's control, and yet for which he is frequently held in strict account.

I have often felt that the loss of a single patient in whom I had a particular interest—and I should hope to have a particular interest in every patient committed to my care—would depress me beyond measure, and give me a sense of disaster and defeat. It would force upon me such a realization of my limitations that half the aspiration of life would be destroyed, and many of my highest ideals sadly shattered. I doff my hat in respect to the worthy physician and the brilliant surgeon, but the uncertainties and disappointments of their calling have no allurements for me.

Do I, then, think that dentistry holds the sum total of all that is desirable in a calling? Not by any means. No one knows better than I its limitations, its exactions and its petty annoyances, and yet it is my office today to uphold some of the possibilities of this profession of ours which I hope may appeal to you as worthy of consideration. Let me affirm at once, with the risk of being considered biased in my judgment, that I verily believe that dentistry, practiced to its highest possibilities, is capable of affording to humanity more immediate, more definite and more tangible benefits than any other profession, with the possible exception of medicine. Medical science has largely succeeded in controlling epidemics and preventing plagues, but as has just been intimated there are many features of medical practice which are still indefinite, full of conjecture, and altogether disappointing. In dentistry we are usually able to diagnose the trouble and afford relief. The greatest lesson of preventive medicine is embodied in hygiene, and the hygiene of the mouth is one of the most important factors in the maintenance of health. So that when a dentist operates on the teeth to render them sound, or on the surrounding tissues to make them healthy, he not only contributes to the comfort of the patient in preventing pain, but he establishes the possibility of normal function in the process of mastication and aids materially in the consummation of hygiene. In this way there is at once a tangible benefit to the patient, and no individual can come under the ministrations of a conscientious dentist without being made better physically. Not only this but where the ravages of decay have marred the appearance of the patient by attacking the teeth that are exposed to view, dentistry comes to the rescue and restores not merely to health but to beauty the organs thus affected. And this is no mean office to perform when we consider how important the teeth are in conserving harmony of countenance. An esthetic face with defective teeth can never be imagined, and when dentisty contributes to make the human features beautiful and symmetrical it becomes an artistic as well as a utilitarian pursuit. And so the dental practitioner who follows his calling conscientiously has the satisfaction of knowing that he is a very useful member of society, and this of itself is not a small incentive to the highest endeavor.

But what shall we say as to the possibilities of the dentist in attaining the greatest measure of success in life—that being naturally the ultimate object of following any pursuit? This, of course, depends some upon what is considered success, but let us define success for our present purpose as the distribution of as much happiness in the world as our sphere of action will permit. This implies happiness for others as well as for ourselves—there is no such thing as real happiness which reverts solely to the individual himself. Happiness is mutual or not at all. To do the most good is to create the greatest happiness. Let us see then how much happiness the dentist may spread about him.

In the first place he may, as just intimated, add to the happiness of the people he serves in a professional way. Besides this he may be a useful citizen of the commonwealth and contribute to the welfare of the community in which he lives by a vital interest in the public affairs of the nation, the state and the municipality. He should study the public utilities of the day and vote at every election. Under proper conditions he may hold public office, but he should not allow himself to degenerate into a chronic office seeker.

The nature of our calling is such that to be a good dentist a man can not allow the diversion of politics to enter too prominently into his activities, and yet I often regret that we do not more frequently see dentists in our legislatures.

At night when his day's work is done he may utilize the evening for the family reunion, the social gathering, the theater, and for reading and study. He should select the best literature and should aim to add each year to the culture which is ever the constant badge of the truly professional man. All this is within the possibilities of the dentist, because his evenings are practically his own. A physician in full practice is never certain of having a moment that he can control. As one said to me in discussing this matter: "When you are done with your day's work you are done, but when I am done it is only when I am done up." And it would seem that above all men the dentist should cultivate his mind and take advantage of the wonderful opportunities at his command to attain a high intellectual status in the community, and make of himself a really cultured individual. It has sometimes seemed to me that the members of our profession should really be the best informed, the best mannered, the best demeanored, the best tempered, the best principled, the best disciplined and the best dressed of any other calling. The reason for this is that for the most part we are dealing with people in the higher walks of life. Did it ever occur to you that we get the cream of humanity for our patients? Every individual who applies to the dentist for service—except those who come impelled by pain for the mere extraction of teeth—does so either because of pride of person or of a higher conception of the utility of professional effort in our complicated modern life. You never see a roustabout from the coal docks or a laborer from the construction gang of a new railroad applying to the dentist for a filling or a crown unless he has advanced far enough in the social scale to have some pride in himself or has learned the utility of these things. And yet the physician is likely to have such a man for a patient and be compelled to treat him for weeks, irrespective of his intelligence or his lack of it. Not that any professional man should feel himself above treating the humblest citizen of the commonwealth, but that it is surely a desirable feature of the practice of dentistry that we are not often called upon to deal with the ignorant or uncouth class of our social structure.

The fact, then, that our work is among those of the highest types of civilization should stimulate us to the cultivation of such tastes and such tendencies that we may meet the most cultured of the human race on the basis of an equal order of intelligence, and I am firm in the conviction that if dentists will avail themselves of the opportunities presented to them by the nature of their calling we shall soon have a profession which shall be recognized the world over as representing a dignified and learned body of men. May the consummation of such a desideratum be hastily speeded, and may you and I do our full share in bringing it about.

Permit me at this time to make a suggestion of a practical nature as to the possibilities of a professional career. The fact that it is too often neglected by members of our craft is my sole excuse for intruding it upon your notice. It relates to the provision which every responsible individual should make for the time when the hand has lost its cunning and the eye has become dimmed. If we live long enough this time comes to all of us and it is quite likely to affect dentists earlier than most men from the fact that our calling demands exceptional keenness of eye and deftness of hand. While I do not place money on a pedestal as a god to be worshipped, and while I recognize the disintegration of character which the mere struggle for wealth involves, yet I insist that a reasonable competency for old age is a necessity to the highest fruition of success in life, and that every professional man owes it to himself and those dependent upon him to make such provision. There is nothing more pathetic in all professional experience than to find an old man with his earning capacity gone and utterly dependent upon others for support—particularly if he has any pride or ambition in his make-up.

The cry is often raised that dentistry is not a lucrative calling, and this is true in the sense that great wealth can not be accumulated in its practice. And yet these matters are all relative and a large fortune is not needed by a professional man. Every dentist, if he will discipline himself to economy and care, can save something each year for the proverbial rainy day. Saving is so much a matter of habit that I am often impelled to beg of young men entering the profession to take careful stock of their possibilities in this direction and to make one resolve at the very beginning of their career. This is, that each year they will spend less than they make. In doing this it is seldom that they will be deprived of any essential element of comfortable livelihood, and the very discipline that is necessary to suppress the spendthrift that seems to be in most of us will add materially to strength of purpose and of character, and make of us better and more responsible men. I can not on this occasion go into the details of the question sufficiently to outline a practical plan of procedure in the accumulation of a competence, but must content myself with these few suggestions in the hope that some of my hearers may be sufficiently impressed to take into serious consideration what I conceive to be an essential and material possibility to a successful professional career.

And now, in conclusion, let me refer briefly to a most encouraging phase of dental practice which I do not believe is often enough considered by our younger men—the very men of all others who should be led to consider it. I have said that if the dentist is systematic with his work he may have his evenings to himself for the cultivation of the higher things of life. What higher aim is there in professional life than the devotion each week or month or year of a certain amount of time for the prosecution of original research into the hidden mysteries which confront us in our daily practice? There are problems today in dentistry seeking a solution which our younger men might easily solve if they would put the right kind of effort into it. I wish I might imbue every young man with the true scientific spirit so that in the early days of his practice, when he has such excellent opportunities, he would begin the study and investigation of some subject upon which the profession needs more light. There is nothing so fascinating as this when the habit is once formed, and nothing that will bring so rich a reward. We often hear an intimation that there is little encouragement for a man to do original research work in dentistry, but this is a fallacy. A man may not at once come into the kingdom of commendation by his fellows, but he will eventually be given exact credit for the good he has done. I never knew a man to work long and faithfully on any problem affecting the welfare of the profession that his work was not finally recognized and fully appreciated, provided he worked along rational lines and put intelligence into his effort. The beauty of modern investigation is that the beginner has the benefit of all the knowledge already gained on the subject and may start where others have left off. The technique of research work is becoming systematized and simplified and the young man may profit by all of this.

There is, therefore, to my mind no more inviting field than the one just indicated, and none half so fruitful of satisfaction and ultimate happiness. The best reward is, after all, not in money, not in fame, not in the commendation of others, but more in the sense of having done some good in the world, and, best of all else, in the actual doing of the work. Say what we will about incentive to effort, there is nothing to compare with the fascination, the concentration, the intense absorption of the enthusiast in the work itself. It takes him away from the sordid things of life and lifts him into the very atmosphere of heaven. It rarifies his sensibilities and adds keenness to the sublime satisfaction of achievement. It is a consecration of his energies, a baptism of his very soul.

Permit me to close with a short poem I have used on a previous occasion to illustrate this idea:

When all the doing is ended,
  And all the record is made;
When all the chapters are written,
  And the ink has begun to fade;

When the world has spoken its praises,
  And the world has spoken its blame;
When the world has heaped the measure
  Of wealth or want or fame;

When the last long look is given,
  And the last receding call;
You will find, whatever pour fortune,
  That the doing was best of all.

SOME PHENOMENA OBSERVED IN FUSING PORCELAIN.*

BY J. Q. BYRAM, D. D. S., INDIANAPOLIS, IND.

A great deal has been written within the last few years regarding porcelain inlays. Cavity preparation has been discussed pro and con and we have come to one conclusion, namely, that cavities should be prepared with as much retentional and marginal strength as it is possible to give them. The relative value of gold and platinum for matrices has also been discussed until we are of one accord, that platinum is par excellent for constructing matrices. But the fusing of porcelain has received less attention than any other phase of the subject. This, however, is just as exacting as any other step in the construction of the inlay. Many otherwise good inlays are spoiled in the process of fusing, and until we learn to fuse porcelain in a more scientific manner we may expect to meet with these failures.

In order to understand the principles of fusing porcelain, it is necessary to consider the ingredients of which it is composed. Such a consideration shows porcelain to be made up of three classes of substances. First, three basal ingredients which are very refractory substances, silica and kaolin, which when heated alone will withstand intense heat with practically no change, and feldspar, a less refractory substance, which when heated to a high degree undergoes liquefaction. Second, fusible substances, known as fluxes, which fuse at a lower temperature and increase the fusibility of the more refractory substances, and third, metals or their oxides used as pigments.

Silica ($Si\ O_2$) is the oxid of silicon, and is an infusible substance, insoluble in all acids except hydrofluoric, "but is slightly soluble in caustic alkalis." It forms about 13.5 per cent of the basal mass. It adds strength and firmness to the porcelain and gives it a more translucent appearance.

Kaolin ($2\ Al_2\ O_3\ Si\ O_2 + 3H_2\ O$) is the silicate of aluminum and is composed of aluminum oxid, silicon oxid and water. It is commonly spoken of as disintegrated feldspar. Through the natural process of decomposition feldspar loses its potassium oxid K_2O by the action of water and other agents. Kaolin forms about 4.5 per cent of porcelain. It is a very refractory clay when heated alone but readily unites with feldspar when incorporated with it. When added to porcelain it gives plasticity, which property permits it to be molded and carved.

---

*Read before the Chicago-Odontographic Society, November 21, 1905.

Feldspar ($Al_2 O_3 K_2 O 6 Si O_2$) is the double silicate of alumninum and potassium. It is composed of aluminum oxid, potassium oxid and silicon oxid. The chemical difference between feldspar and kaolin is that feldspar contains potassium oxid which kaolin does not and kaolin contains water of crystallization which feldspar does not. It composes about 82 per cent of the basal mass of porcelain and adds translucency to it. While feldspar is more fusible than either silica or kaolin, it requires more heat than can be produced in the electric furnace to fuse some grades of it.

The materials commonly used as fluxes, to increase the fusibility of porcelain are sodium carbonate ($Na_2 Co_3$), potassium carbonate ($K_2 Co_3$), or some material containing the oxids of potassium or sodium. The more refractory ingredients, the flux and the color frit, are fused together in the preparation of the porcelain for the market. The fusion poduces a chemical change, forming an indefinite compound from which none of the original ingredients can be removed except by some process which involves the destruction of other ingredients.

For experimental purposes cubes of porcelain 5 m.m. on each face, weighing approximately 2.5 grains when thoroughly dried, were taken as a standard for making tests. All fusing was made in a Garhart furnace with a pyrometer attachment, which indicates the heat by electrical resistance recorded by a milliameter, and automatically cuts the current at any given degree of heat.

The first series of experiments were to determine the fusibility of the various porcelains. As porcelains are indefinite compounds, they have no definite fusing point. Porcelains which ordinarily vitrify from 2080 to 2400 can be fused on pure gold by giving them long enough time. The experiments showed that Brewster's enamel can be properly fused on pure gold in from 15 to 45 minutes. The difference in time depends upon the amount of heat applied. Brewster's foundation (Justi's), Close's body, requires from thirty minutes to one hour and fifteen minutes to properly fuse on pure gold. Brewster's crown and bridge, S. S. White's inlay, and Whiteley's inlay porcelains require from one to three hours to fuse on pure gold, while the consolidated high fusing inlay porcelain requires from six to eight hours to fuse on pure gold.

It was found that Brewster's foundation and (Justi's) Close's bodies could be fused on 10 per cent platinum solder, which fuses at approximately 2115 in from 15 to 30 minutes. Tests were also made with porcelains that ordinarily fuse at about 2300 on 15 per cent platinum solder, which fuses at 2175. It requires from 10 to 20 minutes to fuse Brewster's crown and bridge, S. S. White's and Whiteley's inlay porcelains.

In studying fused porcelain under the microscope, I observed that those porcelains which were fused at a lower temperature for a long time, presented more homogeneous and more highly glazed surfaces, while the surfaces of porcelains which were fused at a high temperature for a short time appeared more granular. The cubes were then fractured and the inner portion examined under the microscope. I invariably found that those porcelains which were fused for a long time at a lower temperature were more homogeneous in texture.

The next series of experiments were made to determine the relative porosity of underfused and overfused porcelain. In studying the surfaces of the cubes under the microscope it was found that the surfaces of overfused porcelain were covered with little blisters. Underfused porcelain appeared granular and less dense. While properly fused porcelain presented a denser surface free from blisters.

The next experiments were to determine the effect of repeated contact of porcelain with the maximum heat required to fuse it. A cub of porcelain was fused at a definite degree of heat. Then a second cube was placed beside the first and both heated to the same degree of heat. Then a third cube was placed beside the two and the three heated to the heat required to fuse them. This process was continued until the fifth cube had been fused. The first, second and third cubes were slightly overfused and were lighter in color while the fourth was slightly lighter in color.

The next experiment was to test the effect of repeated heating of porcelain to the point of biscuiting. This showed that the porcelains would finally become fused and maintain their characteristic color.

It is a significant fact that underfused porcelain has a much duller color and is more opaque, while overfused porcelain becomes lighter and tends to be more transparent. If porcelain remains in contact with the maximum heat long enough it fuses into a glass-like globule. All the shades of a color from a normal to a light may be obtained by increasing the heat above the maximum fusing point of the porcelain, but this is done at sacrifice of its strength.

It is also a fact that porcelain can be fused, then ground and refused at a lower temperature than the first fusing. And if this process of refusing and regrinding be repeated a number of times, a high fusing porcelain becomes low fusing. It was also found that the repeated fusing and grinding of the porcelain changed its properties.

The following deductions are from these experiments:

1. That porcelain has no definite fusing point.

2. By prolonging the time of exposure to heat a thoroughly fused porcelain may be obtained at a comparatively low temperature.

3. That porcelains fused at a lower temperature for a long time will maintain their characteristic color.

4. That low fusing porcelains can be made of high fusing porcelains by repeated fusing and grinding.

5. If a piece of porcelain is thoroughly fused and more porcelain added and fused, the first layer will be slightly overfused. That is the process of applying porcelain in layers and fusing each layer; the underlying layers will be slightly overfused and somewhat lighter in color.

6. That porcelains containing a large percentage of flux are affected more by bubbles than those that are more nearly composed of the basal ingredients.

I believe the method of constructing inlays of two bodies differing in fusibility to be the correct one. The foundation body can be thoroughly fused, and when the enamel colors are placed in their respective locations and fused, the two porcelains give a more natural combination of color than can be produced by a single body.

Many porcelain workers prefer to apply each layer of enamel and thoroughly fuse the porcelain before the next layer is applied.

But I prefer to apply each layer and fuse to a high biscuit, only heating the porcelain to the point of glazing at the final fusing. If a layer of porcelain is fused and then another layer of the same material is added and thoroughly fused, the first layer will be slightly overfused. Hence in the process of applying porcelain in layers and fusing each layer, the underlying layers will be slightly overfused and somewhat lighter in color.

In the selection of colors for an inlay note the variation in color of the natural tooth. There are usually three or more colors, or shades of colors, in a tooth. The foundation of an inlay, representing the dentine, should be yellow (presuming that the tooth is vital), and the overlying colors should approach the color of the enamel in their respective positions. If the matrix lining is to be used, a thick layer should cover the matrix to within one-half millimeter of the margin and be fused to a high glaze. The foundation body should be applied over the white porcelain and be contoured to replace the dentine. It should be fused, provided it is of a higher fusing porcelain than that used to replace enamel. Care should be taken to prevent porcelains of different colors from mixing, when applying them to their respective positions. If the colors are applied separately and biscuited, then a uniform color is applied over the entire mass and properly fused; the colors will be true, and the fused porcelain will approach more nearly the natural tooth structure in appearance.

The uniformity of color in porcelain is dependent upon the accuracy of the fusing. It is difficult to fuse porcelain at a definite degree of heat without some means of measuring the degree of heat used. Many otherwise good inlays are spoiled in the furnace. Then, too, variations of the heat of the muffle will cause differences in the shade and the strength of the porcelain. Underfused porcelain is of a duller hue and is less translucent, while overfused porcelain is lighter and has more of a glass-like appearance.

There is a difference of opinion as to whether the fusing of porcelain is a chemical reaction or a physical change. Some of the best porcelain workers believe it is entirely a physical change, caused by the liquefaction of the feldspar and flux, which flows around the more refractory substances and agglutinates the mass (Richardson's Mechanical Dentistry; also personal letters from various porcelain workers). Others believe that it is both a physical and a chemical change by means of which certain ingredients are united chemically. Because of the fact that porcelain is an indefinite compound it is impossible to determine the definite chemical reaction that takes place during the process of fusing.

While the process of fusing may be largely a physical change, there are, however, some phenomena that are difficult to explain by this theory. If it were largely a physical process the low fusing fluxes would burn out more readily. There would not be such a variation in the degree of heat required to fuse porcelain. The fusibility of porcelain would be increased, instead of decreased, by the process of refusing and regrinding. High fusing porcelains could not be fused at a lower temperature; neither would they tend to form glass when overfused.

I believe the process of fusing porcelain to be largely a chemical reaction, brought about by the various ingredients combining under intense heat to form multiple silicates of aluminum, potassium or sodium with the liberation of carbon dioxide and other gases.

In conclusion I wish to protest against the method of fusing porcelain at its maximum temperature for a short time. It makes the porcelain more brittle and causes the formation of minute bubbles throughout the mass. The intense heat required to fuse the porcelain in a short time causes the generation of gas faster than it can escape. Dr. J. E. Nyman, in the *Dental Cosmos,* October, 1905, very aptly says: "The truth of the matter is, many have been broiling their porcelain instead of baking it, and a porous instead of a homogeneous mass has been the result."

RELATIVE FOOD VALUES.*

BY T. ELHANAN POWELL, D. D. S., CHICAGO, ILL.

The nineteenth and twentieth centuries will undoubtedly be known as the age of science. Original research and investigation in every field of life and endeavor is being pursued along scientific lines. Formerly scientific methods were confined to the realm of astronomy, physics, chemistry and kindred subjects, but today all great industries, such as railroading, manufacturing, farming and even government itself depend for their successful continuation upon underlying principles of scientific truth. Our college courses have been very materially changed within the past few years. The country is dotted all over with schools which have for their aim the teaching of teachers—"How to Teach"—and every progressive State has its college of agriculture. Each university has its chair of psychology, pedagogy, journalism and domestic science, all of which shows the tendency of the thought of the age. Considering the magnitude of the mental effort expended along the lines indicated all for and in behalf of man himself, it is passing strange that more time and thought have not been given to domestic science, which is the foundation for all the hopes which we entertain for the advancement and perpetuation of the being which is the highest manifestation of the wonderful conception of infinite ingenuity. This being, the human body, comprises within itself all the principles of every other machine invented since the foundation of the world.

To be sure there are those who have made a special study of this machine, but there is also woeful ignorance and a surprising apathy toward knowledge of food habits on the part of the masses.

There is such an intimate relation between the work required and the kind of fuel used in producing the number of work units required that it seems a stupendous blunder on the part of society not to teach in a careful and competent manner the facts which will enable the individual to use the necessary food or fuel to bring about the highest functional activity and efficiency, and at the same time to sustain a satisfactory health balance. In animal and plants acquired characteristics as well as natural qualities and peculiarities can be transmitted by cultivation and care, so that we can, by the careful choice and preparation of foods make of man a mighty physical and intellectual force; or, by neglect of the principles of proper feeding, we may have a degenerate and forceless creature, devoid of all that is highest and noblest, so far from the image of God that he will remind us of nothing so much as of a hideous excrescence, thrown off by nature in a convulsion of contrary forces.

---

*Read before the Northern Illinois Dental Society at Elgin, Ill., October, 1905.

There is much erroneous information abroad in regard to dietetics, some holding to a purely vegetable diet; others, that one should eat vegetables in a raw state, and in Chicago we have a sun-worshipper offering a diet of physical culture and hot air to his infatuated followers. All this in defiance of the fact that nature plainly indicates the kind of food required to sustain life, by a dental armature evolved and matured through the use of certain kind of food during a period of unnumbered ages.

Paleontologists know that the dental armature of every animal is of that particular type of masticatory apparatus because in adapting itself to certain kinds of food the tooth type has been evolved.

Physiologists through experimentation and investigation have given us the following table as a per diem dietary for the healthy adult:

	At labor.	At rest.
Nitrogenous substances	6½ to 7½ oz.	3 oz.
Fats	4 to 5 oz.	1½ oz.
Carbohydrates	16 to 18 oz.	12 oz.
Salts	1.2 to 1.5 oz.	.5 oz.

Adding to this the water contained in the food and 50 or 60 per cent more of water taken as a beverage daily, which amount is about three pints, it is manifest from the above table that there is a vast difference between the number of heat units required by the man of active life and the one of sedentary habits.

In addition to the quantity of food required by adult man must be taken into consideration that very important factor which we so frequently lose sight of, namely, the mental element. It is so essential to the proper digestion and assimilation of the food eaten that the atmosphere be pleasant and serene. A cheerful dining room with clean linen and a well appointed table service, and added to this sunlight and agreeable companionship are essential to give serenity to the atmosphere. It is well understood by physiologists that these things have a decided influence upon the alimentary secretions. Besides these conditions, must be taken in account that mysterious element contained by each natural food which causes the nerves of the digestive glands to secrete fluids adapted to the reduction of each particular food in question. Whether this action is due to the flavoring substances of the food itself or to some other unknown influence has not been definitely settled.

Pawlow says: "The gastric juice produced by different food substances varies greatly in both quality and quantity. Milk produces the least active digestive fluid. Meat produces a strongly acid digestive fluid. Bread produces during a long period a moderately acid but powerfully digestive gastric juice. Represented numerically the digestive value of the juice produced by the substances named stands as follows:

Milk	11
Meat	16
Bread	44

Showing conclusively, if this be true, that bread is, indeed, the "staff of life." It shows also another thing—the *unwisdom* of taking into the stomach at the same meal foods which produce the different kinds of acids. The only sane and safe plan is to group together the foods producing *like* digestive fluids; eating these and excluding all others for the meal.

Man could learn a valuable lesson from the lower animals, who confine themselves to one diet for long periods of time, some, indeed, eating only one kind of food throughout their natural lives. One should be particularly careful to exclude from the diet, if a hearty meal is to be partaken of, nearly all fats, including milk, which foods have a reputation for diminishing gastric activity.

Among the food stuffs especially condemned by the new school of dietetics, the following may be enumerated:

Cane sugar—causing irritation and catarrh of stomach.

Fats—which produce satiety and lessen the production of gastric juice.

Flesh foods—which contain uric acid and cause gout, rheumatism, tapeworm, neurasthenia, trichinæ, and tuberculosis.

Oysters—producing typhoid.

Milk—tuberculosis.

Tea, coffee, chocolate—causing catarrh of stomach and bowels and cirrhosis of the liver (Boix).

A most interesting fact and one not generally known is that the amount of food required depends largely upon the skin surface, as the object of food taking is to maintain animal heat, which is chiefly lost through the skin. A man weighing 180 pounds has a skin area of twenty-one square feet, while a child weighing ten pounds has a skin surface of three square feet and needs only one-seventh of the food required by the man of 180 pounds.

The person who perspires freely, whether working indoors or out, on account of the rapid evaporation through perspiration, requires more food than one who perspires very little. With all that has been said and written on the subject one important phase seems to have been entirely overlooked: that is, what should a man eat, viewing him from the standpoint of the comparative anatomist?

Weighing food values from the character of the teeth, we must naturally conclude that man is a vegetarian, for, while having thirty-two teeth in his dental armature, only four (the cuspids), are carnivorous, while the other twenty-eight would indicate that he belongs to the class called herbivora. Experience with animal life has proven beyond question that a change from the natural diet would ordinarily produce disease and death; yet there is little doubt but that if the change is made gradually, including in the change many generations, the extent of harm and fatal results might be materially lessened. Indeed, if the experiment be extended through several thousands of years the food habits and physical characteristics will undergo an entire change. This undoubtedly has been the food history of man, resulting in a diminution of the masticatory surface and a general physical deterioration.

My plea in closing is that we may eat less meat and eat it rare; eat more grain, vegetables and fruits, taking only one or two articles at each meal and masticate, masticate, masticate. If I have been able to make plain to you my reasons for this plea I shall have accomplished the object for which this paper was written.

THE NECESSITY FOR A CHAIR OF ORAL SURGERY IN THE MEDICAL CURRICULUM.*

BY CHARLES E. BENTLEY, D. D. S., CHICAGO.

The present tendency of the age is toward specialism in all departments of the arts and sciences. The day of universal scholarship, when Plutarch and Bacon could go the rounds and label every item, is as extinct as the Saurian epoch. The world is simply too large—life and mind too finite. The all around man of learning, like the all around doctor, is rapidly giving way to the specialist in learning, as in medicine.

In the great centers of medical activity, where the conditions of the survival of the fittest obtain, the men who after careful consideration and thoughtful digestion of the eternal fitness of things have chosen their specialty and studiously pursued it—they are the men who are making their impress upon the medical world and making valuable contributions to the literature of the profession.

So it follows that the good old "family doctor" is fast becoming, in such centers as I have indicated, a counselor rather than a medical attendant. His tenure of medical office is in proportion to his past usefulness rather than present helpfulness. This condition is the result of the demands of the people for the highest services that can be obtained in any given case. The profession has been quick to recognize this condition and its members are rapidly adapting themselves to its needs. As a result, we have many specialties in the broad fields of medicine and dentistry.

Thus oral surgery, as a specialty, has sprung into existence. Not that surgery of the mouth has not been contemporaneous with general surgery since it began, but that those whose special duties confine them to the mouth have so developed the surgery of this especial part that its needs and the accumulated experience of those who are its devotees have made a distinct place for it in the realm of surgery, just as gynecology or surgery of the eye or nose is now distinct from general surgery.

The medical schools of this country have recognized this fact, and as a result, in those institutions that have and do stand for high standards, chairs in this department have been established. Many medical colleges include in their curriculum today the chair of oral surgery and oral pathology. In the development of this specialty the dentist has played an important part. His field of action being confined to the oral cavity, he very naturally has demands upon him for its surgery, so that in the filling of the chairs in the aforesaid colleges the dentist has been chosen as the proper person for such office. This recognition of a kindred profession has been a stimulus to a broader and deeper knowledge on the part of dentists in this particular department of surgery, and as a result fresh contributions to the literature, comprehensive text-books, and a wealth of information have come from dentists working in this line. Several have raised their names from the common level and have made a reputation of national importance. Garretson, Brophy, Gilmer, Marshall, Fillebrown and Cryer are a few men who have won distinction in this line by reason of their creations, and the surgery that is being done in the mouth today is done along the line of principles laid down by these men.

---

*Read before the Northern Illinois Society.

The instrumentation for such surgery has been completely revised by reason of this new stimulus. The bungling operations that characterized the period but a few years ago have given way to those easier of execution and surer of results. One of the inexorable laws that is responsible for the advancement of this specialty is that all operations upon the jaws (save the operations upon the tongue) and associate parts are to be performed within the mouth. This is practiced for two reasons: (1) There is less danger of sepsis in wounds of the mouth, because the fluids that bathe the oral cavity are capable of taking care of the specific germs which produce that condition; (2) that the unsightly scars that are produced by opening into the mouth from without are unnecessary, as ample room is provided within the mouth for the operations and the scars are averted. The importance of any method that avoids scars and conserves the esthetics can readily be seen. To the writer's mind, these two things have done more for the advancement of oral surgery than any similar number of considerations that may be mentioned.

The question might be asked, What subjects should be included in such a chair? The answer might be:

1st. *Associative lesions of first dentition.* What physician is there who has not been baffled in the presence of some of the many lesions that are incident to the dentition of the little folk? This heading should include with the time of the eruption of the temporary set a study of localized stomatitis, irritative fever, diarrhea, spasms and eruptions of the skin. When one considers the delicate and susceptible organism of an infant, he is very well prepared to understand that in the influence of the process of dentition must necessarily exist a powerful predisposing cause inviting the attack, and, indeed, opening the portals, as it were, to enemies that otherwise might pass harmlessly by. In the first place, the process of dentition, while a physiological one, is yet like that of utero-gestation, one of continuous irritation. Irritation, then, is the matter of consideration in all these associative lesions. If we can control this irritation we can abort the results. It is not, however, by any means, to be considered that all infantile diseases are influenced by or even remotely associated with dentition. Mistakes of such nature are quite too frequently made; but that it should always have its full share of consideration in the diagnosis we desire to emphasize. To understand dental irritation one must be familiar with dental evolution. This, of course, means its physiology. We know the varying periods of eruption and we are at once led very directly in our researches. We should be familiar with the diseases that accelerate or retard this process. These, together with the subjective symptoms, should intelligently guide us in the treatment.

2d. *Anomalies of second dentition.* especial attention being paid to those degenerative processes that have remote manifestations, such as pulp nodules, etc., which give rise to persistent neuralgic pains of the fifth nerve and its branches. There are many anomalies that might be classed under this heading, but three will suffice for this purpose:

1. Tooth germs developing in positions where their product must remain encysted.

2. Teeth whose roots perforate the antrum.

3. Impacted third molars. These encysted teeth are often the source of much trouble and not infrequently eventuate in osseous tumors that demand surgical interference. The buccal roots of the first and second upper molars often penetrate the antrum, and if the pulp or, as it is commonly called, the nerve dies in such teeth, it

affords a channel for direct infection. This condition has only to be referred to in this presence to understand its gravity.

3d. *Alveolar abscesses and their sequelæ.* A study of the causes and consequences of burrowing pus, together with the conservation of such teeth—for it is no longer held that a tooth should be consigned to the forceps because it is abscessed. The study of an alveolar abscess becomes interesting to a physician when its consequences involve remote tissue. The formation and confinement of pus in a cavity so obstinately closed as the alveolus of a tooth must necessarily inflict the severest suffering. The burrowing of this pus, following the direction of the least resistance, often finds its exit in peculiarly remote places. Thus, the points just below the malar process, beneath the chin, the anterior nares, and as low down as the clavicle and mammae, are not infrequent exits for the pus. On account of these remote points of exit the source is often clouded in obscurity and a reference to alveolar abscess and the physical characteristics of such teeth are important to the physician.

4th. *Fracture of the inferior and superior maxillæ.* A study of the various splints and newer methods of reduction and the possibilities of restoration in such cases where a large amount of tissue is lost in gun-shot wounds. The great advance in the methods of reduction of fractures of these parts is worthy of the physician's study—particularly of multiple fractures of the superior maxillæ. The introduction of the skull cap for the support of splints for fractures of the bones of the face and mouth marks a rapid advance in the treatment of this class of fractures.

5th. *The various forms of necrosis of the maxillæ,* such as dental necrosis, alveolar necrosis, necrosis from lack of room for third molars, syphilitic necrosis, mercurial necrosis, exanthematous necrosis, phosphor necrosis, and necrosis from injuries.

6th. *Anchylosis of the maxillary articulation.* This heading should include acute synovitis and arthritis.

7th. *Antral diseases:* abscess of the antrum, empyemia of the antrum, dropsy of the antrum, catarrh of the antrum, morbid growths of the antrum and their surgical treatment.

8th. *Trigeminal neuralgia.* This prolific heading is interesting in the study of the many causes that may produce this condition—dental exostosis, impacted teeth, menstrual irregularities, pulp nodules, pathology of the Gasserian ganglion or its branches, together with their surgical treatment, are of interest to the physician and dentist alike.

9th. *Dislocations of the inferior maxillæ,* their causes and treatment.

10th. *Congenital fissures of the lips and hard palate.* A study of the various methods of closure of the clefts and reduction of the hare lips.

11th. *The care of the mouths of women during the period of pregnancy,* a knowledge that should form a part of every physician's armamentorium, so often neglected. The chemical analysis of the oral fluids of women during this period, together with the prophylactic treatment of the mouth, is a necessity that every physician should recognize. The preservation of the teeth during this period is possible by a recognition of the modern methods for such that are in vogue today, and every physician should be taught them in the medical school.

12th. *Ranula.* A study of the delicate operation for the relief of an impacted body within the ducts.

13th. *Oral manifestations of syphilis,* a study of mucous patches and the so-called Hutchinson's test teeth: differentiation of honeycombed teeth, together with the ever present eye affection as an accompaniment.

14th. *A complete study of the benign and malignant growths* that frequent the mouth, with their operations.

These are some of the most important headlines that should be involved in such a chair as I have spoken of and for which men are qualifying themselves. It is impossible for me to fully amplify these headings, from the fear of trespassing on time for more valuable papers. That I have, in rough outline, given you an idea of the scope of such a chair, I sincerely hope. The physician is the better qualified to render good service to his patient for having this special knowledge. My plea is to those of you who are particularly interested in teaching in medical schools. Each year the march of progress is making more strenuous demands for the completed product. Our doctors can not be finished unless their foundations are laid in their schools. Can not our schools of medicine that have done so nobly in producing what they have, still add to their glory by supplementing to the curriculum the chair of Oral Surgery?

TREATMENT OF PATIENTS AND DENTISTS.*

BY DR. H. G. LOGAN, AURORA, ILL.

How should we treat our patients?

Treat them right, of course, carrying out in practice the Golden Rule teachings. Easy to give this advice; not so easy to always know how to follow it out in practice. For instance, we may think when excavating a sensitive cavity for a nervous patient, that if we are to do as we would be done by we would cut enough to make the filling absolutely secure and that were we the patient we would quietly allow such preparation.

Did you ever have any trouble to convince your patient that this was the correct course of action? Well, I have. Not only may I have failed to convince him, but in extreme cases failed in the filling and possibly in some cases lost a patient because of hurting so severely.

In such cases we, of course, do the best we can, perhaps making use of a temporary filling, even against our wishes, replacing with permanent work when condition of patient will allow.

The trouble is we have all kinds of patients with varying dispositions and idiosyncrasies affected by the seriousness of the operation, by the surroundings, and last, but by no means least, by the dentist himself. He, being humane, is subject to the same peculiarities of disposition and environments.

The time before and after taking, as the medicine vender would say, will be considered—that is, the time before, at the time of, and after the operation.

We are well aware that the majority of patients enter the dentist's apartments with much fear and trembling, and he who can receive them in such a manner as to quiet their fears, which are often largely in their minds, by the time he is ready to begin the work has taken a long step toward a successful operation, and in the building up of a practice such a one will be far more successful though lacking in fine mechanical ability, than he who, being the finest of mechanics, is devoid of such tact or ability to understand human nature.

---

*Read before the Northern Illinois Dental Society at Elgin, Ill., October, 1905.

Complaint has been made in some recent literature upon this subject, that colleges give no instruction that helps a young dentist to meet his patients and feel at ease in his relation to them. If such a subject could be taught as successfully as physiology, pathology or chemistry, it certainly would be of inestimable value to the student. Whether it can be any more advantageously than is already done in the infirmary of the college in nearly actual practice, is worthy of serious thought on the part of our educators.

So many things enter into the consideration of the subject of making a pleasing impression upon the patient that volumns could be written and said, indeed have been written and spoken upon the subject. In office surroundings, as well as the dentist's person, cleanliness, externally, internally and eternally, first, last and all the time, followed by cheerfulness, asepsis and on the dentist's part even temper, may be deemed as some of the important necessities.

Some of the remarks by which the patient accosts us upon entering the office do not assist us to a particularly happy frame of mind. "Oh, you villain, you horrible creature, are you ready to murder me?" "I hate you, I hate the very mention of teeth or dentist." "Instruments of torture" and other endearing epithets are threadbare expressions which we are expected to treat as pleasantries on the part of the patient. We therefore smile a sickly, nauseating smile and proceed to talk about the weather.

The extended nervous strain which our work demands from day to day is perhaps not realized by but few of our patients, and it is not to be wondered at for they have their own ills to think about. The days and hours of sunshine that are sandwiched in between the more serious experiences and which are ushered in by the appreciative patients, make life worth living and our work enjoyable. These give us pleasure from the time they enter until they smilingly take their departure.

The great fear of the vast majority of those requiring our services, the one uppermost in the minds of people in general, the one beside which all others in dental operations sink into insignificance, is fear of the pain in preparing sensitive cavities, and about 98 per cent of teeth with healthy pulps are sensitive when being prepared for filling. When the millennium comes so that the dentist can easily, quickly and without permanent injury to teeth or pulp, anesthetize the dentine, painless dentistry will have an existence outside the dental parlor's advertisement. Advancement has been made toward solving this problem in the last few years and we may be on the verge of this new era.

Some of the methods used and some results may be summed up as follows. First, sharp instruments to be used always, the *sine qua non* in all operations. Absolute dryness and application of some drug or combination, as carbolic acid, carbolic acid and adrenalin made more potent by hot air. Results—helps some in majority of cases.

In obstinate cases, fill with cement for a year or two. Results often in being very beneficial, often also proves a failure, because the patient neglects it for several years or altogether. Cataphoresis arrived with a bound and promised much for a time, now largely abandoned as too slow, uncertain and often serious in its effect.

Pressure anesthesia now holds the boards, not only for pulp extraction, but for desensitizing the dentine in excavating for filling. In it we put our trust and may we not be too grievously disappointed. A recent writer—Dr. W. A. Johnston, of Peoria—says upon this subject: "If it were possible to desensitize a portion of the dentine, and, before the medicine used had penetrated too deeply, to prepare the cavity, cutting away all the dentine affected by the obtunding agent, at the same time removing all the medicine, so that no subsequent trouble would occur, then indeed would our work be simplified and painless dentistry be an accomplished fact."

Combined with other desirable accomplishments, a dentist should be able to talk intelligently upon general topics, keep abreast of current happenings the world over and be capable of making a shrewd guess as to what subject will interest the one for whom he is working. It may be doubtful policy to attempt loquaciousness at the expense of sense. A lady was heard to remark that the constant nonsensical chattering of a dentist who worked for her—not in Illinois—and his nervous movements affected her so she wanted to jump up and kick a hole through the window.

Another patient complained that a certain dentist did not say a word from the time he began to work until at the close, when he said, "Seven-fifty, please."

I have one patient who insists that working upon his teeth produces a similar effect upon him as would combing or brushing his hair, that is, a restful, sooothing sensation, and he has had a great many teeth filled. May his numbers greatly multiply.

"Doctor, I broke a tooth from my plate while eating soft bread. It should not break that easy, should it?" Doesn't that sound familiar, just as if you had heard it before? Soft—always something soft. Dr. Fahnstock, now of Cincinnati, is said thus to have answered this query propounded by a lady, "Why, yes, madam. D——n it, they frequently break while drinking coffee."

You have had a call, of course, from the patient who has the worst tooth to pull you ever saw. This kind is usually of the masculine gender and still quite numerous. He goes on to inform you that the last dentist who pulled a tooth for him said he never in all his life saw their equal. Why, he pulled six times and then did not get it all, but broke the jaw. Pieces came out afterward. Such a patient usually feels better if in the effort to disconnect the offending molar he is hauled around the office a few times. It helps to keep up the boasted reputation of his teeth for having the longest roots ever known locked around the jaw, and then he feels he has had his money's worth; also made the dentist earn his.

Much progress has been made in educating the public concerning some common dental fallacies, and yet the father or grandfather having one or two rows of double teeth all the way around is not entirely extinct. I have heard of him within the last two or three years.

Patients often do us a great injustice, perhaps unintentionally, but the harm has been done with no opportunity to rectify it. For instance, she enters the room where other patients are waiting and maybe in a none too pleasant tone tells us the filling which was put in for her last week or month has fallen out. When may she make an appointment to have it replaced? Ninety-nine times out of a hundred she is mistaken, but it may not be convenient to satisfy her of her mistake at that time. Afterward, when it is discovered that the supposed tumbled out filling was the breaking down of a tooth near the one which was recently filled, it is too late to correct the mistaken idea that the waiting patients received. And, besides, she has told her family, intimate friends and the conductor on the car, that she had to go back to Dr. ———— to have a tooth refilled, "and he filled it only last week."

Had nearly forgotten to mention that which I never forget in my regular practice, that is, to say anything about the fee, and more particularly where it is not paid when due. We occasionally have those cases. Good business methods should be employed to collect as soon as possible.

Patients who owe bills, which are past due, if in need of further dental services, will seldom go to the dentist whom they owe to have it done, even when they expect to pay for that particular work. But where forced to pay the old bill are as likely to return to the original dentist for further work as to go elsewhere, more likely if the work has been satisfactory, and work which has been paid for is usually the most satisfactory.

PRESIDENT'S ADDRESS.*

BY J. O. WELLS, D. D. S., MINNEAPOLIS, MINN.

Gentlemen: We convene to watch the clinics and listen to the essays and discussions of the twenty-second annual meeting of the Minnesota State Dental Association. It affords me very great pleasure, at this time, to express to you my hearty esteem and profound appreciation of the honor you have conferred in selecting me for your president. I am grateful for the opportunity to act in my present capacity. I have not found the routine work arduous, but pleasant; not a duty, but a privilege; and as I stand at the termination of my term of office, at the climax of the year's work, presenting for your consideration, as I do, a program so replete with all that is interesting, instructing and elevating, I feel that the present staff of officers have performed well their duties and that we return to you the Association, not as we found it a year ago, but a year better, a year greater, a year more powerful and more effective in accomplishing that for which it was instituted, the elevating and up-building of the profession.

---

*Read before the Minnesota State Dental Association, June, 1905.

I take this occasion to thank the men who have served with me. I have never worked in any capacity where I have received more loyal support, and I realize that my own capabilities have determined the confines of my accomplishments. I appreciate the fact that a man backed by such support can do a great deal, and I will expect much of those who follow me in office.

I desire to express my esteem for the profession generally in the State, and to thank you for your coöperation; especially do I desire to express my appreciation to those of you who have so willingly and so pleasantly complied with the requests of the various committees, you who have made this meeting possible, who are the meeting and to whom be the honor. Finally, as president of the Association I desire to thank the gentlemen who have come to us from neighboring States; I know what it means in sacrifice and inconvenience and we appreciate your magnanimity.

With your permission I desire to consider with you, for a few minutes, Article I, Section 11, of our constitution, which defines the objects of our Association. The section referred to reads as follows: "Its objects shall be to contribute to the elevation of the dental profession by encouraging a full and liberal interchange of opinions in methods of practice and the literary discussion of subjects relating to dentistry; to advance the standard of dental education; to promote the usefulness, honor and interest of its members; to enlighten and direct public opinion in regard to the duties, responsibilities and requirements of the dental profession, and the maintenance of a high order of professional excellence among its members."

In order that any organization fill completely the sphere for which it was instituted, or accomplish the mission for which it was originated, it is necessary that these objects be clearly and intelligently understood by those in power and that they work harmoniously along what is mutually agreed to be the best line of action. It follows, then, in order that we, the Minnesota State Dental Association, accomplish that for which we were instituted, it is necessary that we understand our mission and that we set about the best means of accomplishing it.

In the first place, we are "to contribute to the elevation of the dental profession by encouraging a full and liberal interchange of opinions in methods of practice and the literary discussions of subjects relating to dentistry."

That we may accomplish this object the membership of the State Association ought to include the dental profession of the State. It is the duty of every ethical practitioner in this State to be a member of the State Association and of the unethical to mend his ways. I would not discourage other organizations; there are many and good reasons why they should exist. On account of the great magnitude of the work it is necessary that we have organizations which meet more frequently; on account of the great diversity of the work, it is necessary that we have organizations where men interested in the same line of work may join together; on account of the differences in men themselves, it is necessary that we have organizations where those congenial may gather and where they may labor harmoniously in the fields most to their liking; but the membership of them all should be included in the membership of the State Association. It is a lamentable fact that our membership is much smaller than it should be. Out of nearly seven hundred practitioners in the State we have 228 members; of the remainder only fifty are advertisers. This gives us nearly 475 eligible to membership. We see from a consideration of these figures that those who ought to be members are almost double in numbers to those who are members. It is a pleasure, however, to note the small percentage of men who are really unethical.

This is the first place, then, where our united effort should be employed. We should bring these eligible men into the Association. How shall we do this? In the first place the Association must be worthy; it must hold out inducements that will attract the desirable element. This, I think, is the condition already. It ought to be the desire of every ethical man in the State to be affiliated with the State Association. We have an Association in which we not only derive great benefits ourselves, but in which we may be of benefit to others. It seems to me that these two facts alone are sufficient to materially increase our membership if those who are still outside will carefully consider them. It remains, then, to have these facts, with others equally true, brought in a pleasing way to the attention of those we desire to reach. It is a pleasure for me to be able to tell you that the present membership committee has carried a systematic campaign during the past year in an effort to reach the men who ought to be members of the Association and I confidently expect much from the work. I would earnestly recommend that their successors in office take up the work where the present committee leaves off and make an even more vigorous effort to accomplish the desired end.

It is one of my greatest desires to see the dental profession in the State a unit in the State Association. To see personal differences and professional antagonisms set aside and the dental profession harmoniously united in the work of this Association for the welfare of the cause of dentistry. Then when this is accomplished we can truly "elevate the dental profession by encouraging a full and liberal interchange of ideas in methods of practice and the literary discussion of subjects relating to dentistry."

Secondly, "We are to advance the standard of dental education"; and we are not only to advance the standard, but we are to teach dentistry. This is one of the most important ends for the realization of which we are to labor. This Association should at once serve as a stimulus, ever urging the colleges to higher and more thorough teaching, and at the same time should be a post graduate school itself, taking up the work where the dental schools leave off and developing to maturity the principles there laid down.

The schools, of course, do a great work in fitting young men to begin the practice of the profession. At best, however, they but lay a foundation upon which to build; they but establish a point from which to start. The rounding into successful professional men must be done elsewhere, and herein lies the great field of usefulness of the Dental Association. It is to take these young men fresh from the dental schools, where, under the most desirable conditions, they have gathered but a few ideas, pilot them safely around the points of danger that lie so near the surface, and yet which are so indistinguishable to the inexperienced eye, equip them with the knowledge that they can only obtain by a full and liberal interchange of ideas, and finally launch them upon the great sea of the practice of dentistry, well fitted for a career of usefulness. In order that the accomplishment of this end be facilitated, the recent graduate should never lose sight of the fact that one of the very first things he should do after leaving the college is to identify himself with the State Dental Association.

Again, the Association is "to promote the usefulness, honor and interests of its members." In executing this one thought of the men who drafted this constitution, we all might find useful employment during the remainder of our natural lives; and what more laudable ambition might we have, what more honorable duty might we strive to perform than to promote the usefulness, honor and interest of those with whom we are here associated? This object is purely ethical in its nature and will be accomplished when the ordinary course of affairs is actuated by ethical motives. The Association, in providing an occasion for, is also a means of a full and liberal interchange of ideas. This object, when successfully carried out, not only increases the usefulness of some members, but is a means of usefulness itself to others. This is nicely illustrated in our annual meetings, where some act as teachers and others as students; this condition should be exemplified not only in the meeting, but should be carried throughout the year, when we will grow and develop ethically as we have never grown or developed before.

Finally, we are "to enlighten and direct public opinion in regard to the duties, responsibilities, and requirements of the dental profession." This object is missionary in its nature and is one of vital importance since in it lies our safety as a profession and upon its successful prosecution depends our welfare or our disaster. The laity should be as well informed regarding our requirements, professional and otherwise, as we are ourselves. This is especialy true of our legal requirements, since we must depend upon our legislators for our laws and since it is so vitally necessary that we have wise and just laws for the regulation of the practice of dentistry. It is evident, then, that we, the dental profession, who know, or ought to know, what is best for the profession and the laity, should keep those who represent us in the legislature closely in touch with our requirements along these lines. They should know, and should be made to appreciate as thoroughly as we do, that the laws are not for the protection of the profession alone, but for the protection of the public as well. They should know that our State board is not to limit the number of practitioners, but to cull out those incompetent to practice. They should be made to see that it is dangerous and ill advised to have these matters tampered with by men who are absolutely ignorant of what is for the best interest of all concerned in dental affairs. Let us see to it, then, that we so thoroughly inform the public of our requirements along these and other lines that our legislators will at all times be in possession of the true conditions. We should remember always, of course, that in insisting on certain requirements we assume corresponding obligations which it is our binding duty to perform.

Now, in conclusion, allow me again to express my appreciation of the honor you have conferred upon me, and pledge to you my continued coöperation in the work, and my time, whenever my assistance may be needed.

ANESTHESIA.*

BY DR. A. D. KYNER, MOWEAQUA, ILL.

The chairman of your program committee notified me to prepare a short paper on some subject that would "last all afternoon and evening." This most remarkable request was as much of an enigma to me as the greeting the old negro gave his employer when he saluted with, "Good mornin', Boss; colder than it is, wasn't it?" Now, to write a short paper and make it last that long required a thoughtful selection of the topic. So by carefully eliminating those which I knew would not meet the above requirements, I finally decided that prolonged anesthesia possessed the necessary qualifications to stand the time ordeal. Further reading of the letter, however, informed me that he meant that the meeting would last all afternoon and evening, and not the paper, so I have changed the caption to just "Anesthesia," and will endeavor to the best of my ability to call your attention to some of the disadvantages of chloroform and ether in dental operations and briefly show at least two causes why the rate of fatalities is high, and to urge the use in their stead of N_2O gas, which is a safe and efficient anesthetic for dental operations, with but few exceptions, which will be noted later. The study of anesthesia has ever been fascinating to the writer. Intimate association with members of the medical fraternity at my present and former locations, enabled me to act in the capacity of anesthetist in a number of surgical and obstetrical cases, and while the number should have been far greater than it was, still the experience has its practical value and begets that confidence so essential to conserving the best interests of our patients when serving them in this important part of our work.

---

*Read before Macon-Moultrie Dental Society, December 14, 1905.

Chloroform and ether are the agents usually employed in major operations by the general surgeon. N_2O gas, ethyl chloride and, more recently, a mixture dispensed under the name of somnoform, are most commonly used by the dental surgeon in inducing anesthesia. The subject of local anesthesia will not be considered, as the time is limited, and when it is brought before this society it ought to be at the hands of one who makes exclusive use of this method in his practice.

The discovery, history and scientific properties of the above drugs can be ascertained in any standard work on anesthesia and will not be enumerated here. Among the numerous authorities on this subject, it will be noted that all agree that chloroform and ether are not indicated in the dental operation of extracting teeth. Now, when scientific men agree on anything it is worthy of special consideration, and there must be some definite and exact cause for this unanimity of opinion. I believe that the reason is found in the fact that as many people die under anesthesia in minor operations as in major ones. For instance, Lyman, in investigating the cause of death from chloroform in 393 cases of fatalities, found that forty were caused by inducing anesthesia for the extracting of teeth, a large per cent were from minor operations, such as opening boils, removing ingrowing toe nails, etc., and in a majority of these cases it was reported that only a small quantity of anesthetic was used. Now we, as dentists, should ascertain, if possible, why so many died in the dental chair. Among the probable reasons, two will be mentioned as the most common causes for trouble, viz.: Faulty posture and insufficient anesthesia. To anesthetize a patient in any position other than a recumbent one is faulty. This is not so true of ether as chloroform. The former produces a marked engorgement of the cerebral vessels and thus tends to abort anemia of the brain. This property of ether of stimulating the heart and congesting the brain makes it relatively six or seven times safer than chloroform and, unless contraindicated, should always be selected for dental operations if a general anesthetic (other than N_2O gas) is to be employed. But if this agent is used, the patient should be anesthetized in the horizontal posture and then slowly raised to a convenient position for operating and carefully watched for cyanosis. Now, the action of chloroform is diametrically opposite. It is a powerful heart depressant and the natural sequel of course is anemia of the brain. This being true, it is imperative that the patient should be anesthetized in the recumbent posture and left there. To raise your patient is to court death from syncope. Now, why is the patient safe while remaining in the proper posture and dangerous if changed to a sitting or semi-sitting position? As has been stated, chloroform is a powerful heart depressant, and in its weakened condition the normal blood pressure is sustained with difficulty. If the patient is in the proper position, the head is on a level with, or slightly lower, than the chest and abdomen, thus favoring the cerebral circulation, and so long as this condition is maintained our patient is practically safe. Now raise the patient to a sitting or semi-sitting posture and what happens? The blood has a tendency to gravitate in the large abdominal veins and capillaries (the splanchnic vaso-motor systems that control these vessels are paralyzed and dilation is a consequence); blood will not run up hill to the brain. The depressed heart pumps the blood weakly into the arteries with insufficient force to produce a return flow. The right side of the heart is emptied, the pulmonary circulation fails, and dangerous, if not fatal, symptoms occur. Most of you have seen teeth extracted for patients under chloroform anesthesia in a sitting or semi-sitting position with no harmful results. You have also, no doubt, seen chloroform administered in an air-tight cone with all air excluded, and the patient survive the ordeal, when it is generally accepted that chloroform should be given drop by drop with the percentage of air in the nineties. Theoretically, every one of these patients should have died, but they did not because of the wonderful toleration inherent in the human body. But one in every four thousand does die and if we should be so unfortunate as to be the anesthetist to that one it would be but poor consolation to know that we had given chloroform and no air and had placed our patient in a position favorable to inducing syncope. Neither give chloroform that way yourself nor permit it to be so administered by another. It seems almost a presumption upon the intelligence of this body to infer that chloroform is ever given in our offices as described, but cases are probably within the knowledge of a number of you gentlemen who will bear me out when I say that this drug is often employed in just the way experience has taught us not to use it, and the fatality that happened in the dental office in Taylorville but a short time ago is only what is liable to occur in our offices, unless we use it, or see to it that it is administered (if at all) according to methods that are known to protect and safeguard the patient. And then if an accident should occur, we can at least go to jail with a clear conscience, knowing and feeling that we produced the death in a scientific manner, taking no unnecessary risks.

Incomplete or partial anesthesia as a cause for accidents is usually brought about in this way: A patient comes into the office (usually a woman—there would be more men if they didn't have to sustain boasted courage of the stronger sex) and wants a tooth extracted, but can not stand to be hurt. Her nerves are all gone. She wants to take just a little chloroform (they never ask for ether; it smells and tastes too bad), not enough to put her to sleep, for then she might never wake up. But just enough so that she will not feel the tooth when it comes out. This simple and innocent sounding request, if complied with on our part, renders a trivial operation—that would not be at all dangerous if no anesthesia was used or complete narcosis attained—extremely dangerous under imperfect anesthesia. Now, if we put this patient under complete anesthesia, all reflex action will be abolished. The sensory nerves no longer carry impulses of pain. Irritation to them no longer shocks any nerve center. But if anesthesia is incomplete or imperfect, the shock or pain from extracting a tooth may contract and arrest the heart action. At the same time the blood continues to rapidly flow into the dilated capillaries and veins, the heart fails to maintain sufficient blood pressure to re-establish the normal arterial circulation and, as in the case of chloroform acting with gravity (or faulty posture), we get the same results as in the former case. An authority, writing on this point, says: "A man is suddenly bled into his own vessels as effectively as into a bowl." Now, since it is so necessary that sensation and reflex action be kept in abeyance, let us either induce complete narcosis before operating or refuse to give any. Do not let a patient sniffle at a little chloroform and then run the risk of reflexly stopping the heart through not abolishing all sensation. Better let such a patient walk out of the office and go to some one who is not afraid of a little thing like reflex action. There is a so-called initial stage induced early in the administration, but it is transient and difficult to detect, as the different stages usually vary in different individuals, and I know of no way of ascertaining just when one should operate in the absence of the usual signs of narcosis. The writer very distinctly remembers one case where only the timely help of a large member of the medical fraternity prevented him from being whipped because he attempted to operate just before or just after the initial stage was reached or passed. And I would advise you, if you are operating for a man, to be ready to either fight or run if you try to strike this particular stage, for you may or may not operate just at the right time. There are other reasons less important why chloroform and ether are not adapted to the needs of the dentist. I will briefly mention, time required to induce anesthesia, and care of patient during and after recovery. The additional expense of the anesthetist usually results in your services being gratis. Vomiting is almost a certain sequel of chloroform and ether anesthesia. This, of course, might come under the head of care of the patient, but is specifically mentioned to call attention to the fact that only optimistic men of cheerful dispositions should subject themselves to this kind of service. Other reasons might be mentioned, but enough have been enumerated to show that chloroform and ether are not convenient and safe agents for dental purposes, and in their stead let us briefly consider N_2O gas. The history of this agent is familiar to all of you. Discovered by Priestly, its anesthetic properties first noted by Davy, how a chemist named Colton at Hartford, Conn., publicly demonstrated its effect when inhaled; and at this meeting Horace Wells, a dentist, noticed one subject who mashed his finger while under its influence and was unconscious of the injury. Wells' attempt to use it in his practice resulting in failure through using impure gas and faulty apparatus. Improved methods of administration and pure gas today renders its employment by the dentist almost universally successful. The properties that it possesses of inducing rapid anesthesia, followed by equally quick recovery, with little or no inconvenience to the patient; its relative safety, and the recent improved methods of prolonging the anesthetic state indefinitely, recommends it as fulfilling our requirements. To show that it is being more extensively used than ever before, I have only to call attention to those who gave gas in this city five years ago and compare with the number who use it at the present time. Now it is all over town; then only one man regularly used it in his practice. The improved apparatus of recent invention probably accounts for its more extensive use today than when the method of discontinuing the administration when the operation began resulted in so short an anesthesia that only a rapid operator could get practical results. Now it is possible to maintain a state of anesthesia indefinitely, and we can perform our work deliberately, with gratifying results to ourselves and patients, thus avoiding the haste that often resulted in painful injuries to the patient, such as bruised and cut lips and cheeks, torn and lacerated gums and fractures of the alveolar process. These accidents could not be very well avoided when former methods were used, but today they are the signs of antique dentistry or carelessness. To try to describe how N_2O gas should be administered would be a fruitless attempt. The toleration susceptibility varies so greatly in individuals that there can be no rules. But after one has used gas for some time, he will have learned to expect certain results from the several classes that his patients are divided into. He will find that little babies can be anesthetized with astonishing rapidity, and recovery is equally rapid. Young boys and girls are splendid subjects, but with a tendency to vomit. Healthy young men and women are fair subjects; middle and old aged persons are the best. All weakly and sickly persons are splendid gas subjects, as they do not possess much toleration or resisting power. Neurotics are usually bad actors. Many of them pass into a peaceful, quiet sleep and recover instantly when the work begins. Others of the same class will laugh, cry, or sing, frequently shout at top-most voice, usually accompanied with defensive or offensive movements of the body and limbs. These are poor subjects and we are glad that they are not very numerous. Do not attempt to anesthetize an old toper unless you are a rich man and want experience. The same is true of persons addicted to the use of morphine, chloral or cocaine; they are all immunes. The writer once witnessed the remarkable feat of a young man inhaling four pounds of ether and three and one-half ounces of chloroform without producing anesthesia. A case just the opposite was where an old lady was perfectly anesthetized after inhaling not more than ten drops of chloroform. Between these extremes we have plenty of patients that can be satisfactorily anesthetized with gas and to successfully accomplish this requires what most things do—experience. If we take an average patient, it is well to assure them that there is no danger. Always have a third person present if the patient is a woman. Do not allow a friend to hold the patient's hands—it partakes of the nature of a farewell. If possible, the patient should have been without food for four or five hours. This is imperative if a long operation is to be performed. The clothing must be loose, respiration must be unimpaired. Do not encourage movements of the hands, etc., to direct you as to the patient's condition. They are apt to become automatic. Have the room quiet, so that you can keep the patient's mind fixed on the breathing (also the sounds become magnified and are disturbing), and if this is accomplished, in from one-half to one and one-half minutes narcosis will be complete, and you are ready to operate. Recovery is usually uneventful and the patient can soon leave the office unassisted, and little worse for the experience. If the operation has been a long one, retching, and sometimes vomiting, occurs. As mentioned above, children are prone to emesis, which need occasion no surprise. Prolonged sickness usually indicates that blood has been swallowed. A good remedy is a half glass of hot water. If relief is not afforded, give an emetic. As there is no way to prevent post-extraction sickness, we can only hold out the immunity from pain as an advantage over the above disadvantage.

There are but few contraindications to the use of gas and these are limited to advanced stages of lung diseases and lesions of the arteries, as an aneurism. Persons so afflicted had better not take it and we will leave this class of patients to some member of our society to tell us how to extract their teeth under local anesthesia. The writer has used neither ethyl chloride nor somnoform, nor seen them demonstrated, so is not qualified to do other than mention them in the hope that some one present is familiar with their action and will bring them out in the discussion.

This subject is so big that it can not be exhausted in a short paper, and as there has been so much left unsaid, you gentlemen ought to have plenty to talk about in the discussion which I hope will follow.

DENTISTRY AS A BUSINESS.*

BY S. A. HELCK, D. D. S., GRAYVILLE, ILL.

A man who has chosen this profession has many problems to master before he is a successful man.

After he has completed his course of study in college and received his degree, he must find a location, fit up his office, hang out his shingle, and then if he is the right kind of a man he is ready for business.

A man who would make a success of this profession must practice the golden rule. He must remember that he is not out to make a fortune in a single deal, but to gain a reputation by fair and honest work of the highest type. If a patient seeks your advice, tell him what is best for him, not what is best for you from a financial standpoint.

To make your business a successful one, be systematic in everything you do—in your book-keeping, in your records of services rendered, in fact, everything that pertains to your daily routine of work. Do not do things in a slip-shod manner.

Be punctual. If you have certain hours for business—and you should have—be there; not fifteen minutes later, but exactly upon the dot. Make your appointments and be on hand to keep them.

When we have patients we should know exactly how to handle each one, be they old or young, nervous people, or little children. We should study human nature. The nervous ones and the children need all the encouragement that can be given, and each, if tactfully handled, will soon find the dentist to be his friend and not one who wishes to see him suffer.

In the hum and hustle for business, we must not forget the world. We need not only rest, but recreation, and the sources are many, viz.: spending an evening with a neighbor and talking over current events, attending social gatherings, attending church, and many other things too numerous to speak of, but which will benefit you and yield excellent returns if you do not use them merely to advertise your business.

---

*Read at Wabash River Section of Illinois State Dental Society, Newton, Ill., October 17, 18, 1905.

Be a man alive to the best interests of the community in which you live. Be bright and cheery, greeting everybody with a pleasant smile. These, together with hard work and perseverance, will make your profession a most successful one, and of which you may well feel proud.

PROCEEDINGS OF SOCIETIES.

ODONTOLOGICAL SOCIETY OF CHICAGO.

A regular meeting was held November 14, 1905, with the president, Dr. J. H. Woolley, in the chair.

President Woolley delivered his annual address. He selected for his subject "A Résumé of the Society's Work During the Year."

DISCUSSION.

Dr. E. R. Carpenter:

A new departure in the annual address of the president, I believe, was set by my old friend and confrere, Dr. Perry, and while I think it is one of the best things that has ever been instituted in the shape of a model for the annual address by the president of any professional society, it, at the same time, is one that is very hard to discuss because the various points that were made in the different papers read during the year have been so well brought out.

It is oftentimes said that a review is better for students or for thinking men than new things, because they have heard and seen the old things that they once knew in their minds, and the president's address in the line of a résumé of the year's work of the Society has demonstrated that to my mind.

I want to thank Dr. Woolley for the masterly and skillful way in which he has presented the subject and the work of the year, so that it is again plainly set before us.

As to the question touched upon in his paper of appointing a special research worker, I believe the suggestion is on the right line. But it is a great question as to how the money can be raised for that purpose. In the older cities it might be met with less difficulty than here. I would be glad to see that done, however, and to contribute my mite for that purpose.

Dr. J. W. Wassall:

It is needless to say that I have enjoyed the president's address very much, and I feel that the Society has been doing good work in the past year.

In regard to establishing some worker in original research, that is a matter which is fraught with a great deal of difficulty. Even the medical profession, who have rich people interested in such movements, find it very difficult to establish chairs or professorships for carrying on research work. We have here in Chicago a large fund set aside for investigating the infectious diseases of children. They are building a laboratory and this work is going on. It seems to me the easiest way to get at this matter would be to have them undertake dental research work as well. I have no doubt that there are many wealthy people in Chicago who would gladly contribute toward the carrying on of original investigations in the etiology of dental diseases. I think they can be made to appreciate the advantages of some such work as that. If Dr. Woolley has been the means of starting such a movement as that, I am sure he will deserve the gratitude of the whole world.

Dr. C. P. Pruyn:

I thank you very much for the courtesy extended and the invitation given for the members of the Illinois State Board of Dental Examiners to be present with you this evening, and to participate in this discussion. We are in session now, as you are aware, and our duties are arduous. We have considerable work to do. However, when an invitation was extended to us through Dr. Reid, we could not very well refuse its acceptance.

Judging from the résumé of the work of the Society during the year, as given by Dr. Woolley, I imagine you must have had a very interesting and instructive year. It so happened that I was present at one of your meetings when Dr. L. L. Davis read a paper on "Pyorrhea." That was certainly a very interesting and instructive paper. The sociability about the festive board which seems to prevail throughout this Society proved to be really of a high order. I enjoyed it very much.

Regarding the résumé of the work of the year, I can say but little. The suggestion made by your president has been a pet theory of his for years. He has felt the need for such an institution, a post-graduate school, or a chair endowed in some institution by somebody, so that original researches may be made in all the diseases which invade the oral cavity. Whether the profession at large is in a condition to accept this suggestion at the present time is a question. Is it sufficiently far advanced as a profession to take up a work of this kind? We are very young yet. We are hardly out of our swaddling clothes. It is true, we have made remarkable advancement during the last decade or two, but are we in a condition to take up research work of this kind? Is the public sufficiently interested in the work of the dentist to assist us financially, because it means a financial outlay upon the part of some one along the lines that have been suggested. And still some of our greatest and most original research work has been done by poor men, comparatively speaking, in their particular professions. Let us take, for instance, the work that has been done by Koch, by Pasteur, by Miller, and by our own Drs. Senn and Black. These men have done wonderful work. They put their whole life into it without financial aid from any source outside themselves. The only way to have such work successfully carried out is by having men who are so permeated with the thought of the work that they will give their lives to it and develop it. This is the only source from which we can expect aid rather than from outside sources.

The great work done by Carnegie in establishing libraries might have been devoted to better purposes if the means had been put into the hands of our national boards of health. There is a great field for work along this line of sanitation, and I am in hopes that the time will come when we will have connected with our Cabinet at Washington a Secretary of Public Health beside the other secretaries that the President of the United States has to aid him. I know of no particular work which would be more beneficial to the people at large than this, for it is upon the health of the people that our success and development depend. When we notice the wonderful work that has been done along hygienic lines by the Japanese, and how small their death rate and losses have been during the late war, we are spellbound with admiration. It is really wonderful that such a people could have developed such wonderful work along sanitary and hygienic lines. But they did it by themselves. See how far they have advanced in the treatment of diseases and diseased conditions on the battle-field, and how they care for their wounded. Consider the small percentage of deaths which resulted from sickness among the Japanese soldiers. When we compare statistics of their deaths and losses with our own during the late Spanish-American War, we are not only astounded, but deeply chagrined. There was a time when the people of this country and other countries looked upon the Japanese as semi-barbaric, but we have changed our minds. So if this work is to be brought to a successful termination, it must be done by means of having men who are baptized with the thought of giving their whole time and attention to it. When this has been accomplished, we may expect to gain some financial aid from those who are outside the profession.

Dr. Edward A. Royce:

Dr. Woolley has given us an interesting address. Not only this, he has shown great interest in the work of the Society ever since he has been president. The earnestness with which he has taken hold has prompted us to be present and do the best we can to build up the Society. The Society has gone through several changes during the year which we regret. But if we will all take hold with the earnestness of our retiring president, Dr. Woolley, I am sure we will not lose by those changes, or, rather, that those places will be to a greater or lesser extent filled.

Personally, I wish to thank Dr. Woolley for his interesting résumé of the work done in the past year. This, to me, is decidedly a Woolley night.

In regard to the suggestion made that somebody be appointed to devote his entire time to scientific research, it is one of the most desirable things we could have. We surely lack in that direction. A man may practice medicine, surgery, or some other profession and employ his leisure moments in doing scientific work. But the men engaged in the practice of dentistry, who are extremely busy, after they have completed their usual routine of work, in order to be able to confine their minds or attention to scientific research, must not only be phenomenal in physique, but they must have great enthusiasm for the work. If somebody could be selected for this purpose who has the enthusiasm, who is not confined to the routine work of dentistry, we might get results which it would be impossible to get if we depend entirely upon those who are standing at the chair day in and day out.

Dr. G. H. Damron, Arcola, Ill.:

I do not know but what there is a good deal of jealousy running through my veins when I meet with you gentlemen in Chicago occasionally. My jealousy is caused because I can not meet with you oftener. You gentlemen in the dental profession in a city like this meet frequently, rub up against one another, and get ideas, exchange opinions and compare notes. Those of us who live in small country towns have to plod along as best we can, and when we come before such a body as this I do not think we should be called upon to speak.

We ought to be allowed to sit still and learn. I have learned a great deal from the different members who are present. There are many of you who have been of a great deal of service to me in the last four or five years, and I have learned a great deal from you.

I like Dr. Woolley's paper very much, and there is one thing I want to speak of since you have called upon me, and I suppose I have the privilege of speaking to you candidly.

Dr. Wassall spoke about establishing a permanent chair which shall be devoted to the study of the etiology of diseases of the teeth, and he thought that it might be done through the medical profession. I can not agree with that suggestion, for the reason that the dental child was born just about as early as the medical child. It at once learned to stand on its feet. If you will stop for a moment to think, you must know that there was a witch-craft about medicine for hundreds of years; superstition was kept to the front. But these never did exist in dentistry. Dentistry had to be an absolute fact. The work of dentists had to show for itself. Mistakes as well as good work showed. In medicine it has been different. I do not think we will ever get on our feet if we accept the suggestion of Dr. Wassall of having the medical profession assist us in establishing a chair of scientific research. I am aware that dentistry is considered an adjunct to the practice of medicine, and if you will look at your dental operations and your medical treatments, and compare the percentage of successes and failures in the two professions, you will find that our dental successes will average about 98 per cent, while medical successes will go below 70 per cent. In making that statement we see that in 30 per cent of the cases medical treatments fail, and the patients either die or are not cured. In the ordinary diseases of mankind, if no medicine is given, it is said that 80 per cent of the people will live. They will pull through any way. The dentist, on the other hand, when he operates in the human mouth, knows exactly what the result is going to be. If he has got good texture of teeth to work on, and well prepared cavities, if he is a good mechanic, he can put in fillings that will do his patient an immense amount of good and they will last for years. If he gets a patient with weak teeth, with soft tissue, he must tell that patient that he can not expect the teeth to last more than a reasonable length of time, and that he will have to return for further treatment. Take the practice of medicine, for instance, and physicians are never asked to guarantee a cure. If you practice dentistry, you are confronted with the question of the patient, Do you warrant this work? I do not believe there is any man here who will warrant or guarantee his work. Of course, there are some dentists who will do this. The question is put to us occasionally, How long do you warrant your work? It seems to me we should strive to get beyond that, as we are not running an insurance office, but a dental office.

While we may be considered an adjunct of the medical profession, I am in favor of having such research work done by dentists. Let us hew away from the practice of medicine. Let us say, we have just as much right to charge for our time as they have. We can not acquire a dental education any quicker than one can a medical education; and yet if a practitioner of dentistry in the country charged so much per hour as a physician did, as, for instance, for lancing a boil, they would run him out of town.

DR. J. G. REID:

I was much pleased with what Dr. Royce said regarding the president's address, as he has expressed my views very clearly, and therefore it is unnecessary for me to repeat what has already been said.

The suggestion that has been made in regard to the appointment of some one to conduct dental research work is not an entirely new one, because I think it has been brought to the attention of the profession very distinctly. Such a movement was discussed many years ago at a meeting of the Illinois State Dental Society. A great deal of enthusiasm was worked up at that time regarding this question, but this enthusiasm only lasted a few months. It then died out. This is a revivication of that occasion, and there has been nothing done toward establishing such a chair. The Illinois State Dental Society went so far as to appropriate funds for a year or two in succession, looking toward and devising means for assisting research work. But the spirit soon died out. It showed apparently that it was inapplicable. The only way, it strikes me on the spur of the moment, to establish such a chair would be for some rich dentist (and I do not know many) to die, particularly if he has no family, no friends to whom to bequeath his money. We can not depend upon men to do such research work in dentistry who have to rely on filling teeth to get their bread and butter. As long as we have to contribute money out of our own pockets annually, semi-annually, or triannually, we will never have much research work done. We can not look forward to that day. We must find some one who is charitable enough to establish something of that kind that will be self-sustaining, and when we have found that sort of individual we may find a man who is willing to devote his time to research work. I believe we have such men in the dental profession. We have men today who are plodding along, doing something for us daily, but who are depending upon filling teeth for their bread and butter. Those gentlemen are burning the midnight oil for the benefit of all of us. They are poor; they will die poor. The suggestion of the president is a good one, but it now remains for us to devise a plan by which it can be carried out.

Dr. George W. Cook:

I appreciate the address of Dr. Woolley very much, and yet really I was sorry to hear some things he mentioned, because it brought back to my mind some of the foolish things I said myself. The doctor covered a great many points which we discussed in the Society during the past year. However, many of the things he spoke of will refresh our memory a little. Subjects pertaining to dentistry can never be too freely discussed, and probably never will be.

The suggestion of Dr. Woolley with reference to the establishment of a chair for research work reminds me of some of my own feelings in the matter. I became enthusiastic when Dr. Pruyn was speaking about devoting some of my life work to this research work; but when Dr. Damron spoke I was further reminded how very poor I am. So I do not know whether I can devote as much time to research work as I thought I could. But, really, there is a practical side to the question. Dr. Wassall spoke upon the question of getting medical men to take up this matter in connection with the research work on infectious diseases, established here in this city. Dr. Damron made a point which impressed me very forcibly, namely, the necessity of the dentist doing this work himself. My observation has been—and I think it has been the observation of every man who has done any teaching in dental colleges—that the medical man is the poorest teacher in a dental college we can possibly have. I do not wish to be understood as saying anything that is disparaging to the medical practitioner in regard to research work, but it is well known that medical men as research workers are about the poorest we have. The men who have done research work, who have undertaken scientific investigation in the field of medicine, have been men who have had some medical training, and that is very essential in doing any kind of work. These men have devoted their time and attention and have kept more or less in touch with medical work; at the same time they have not had to devote their time to the practice of medicine as a means of earning a living. As an example, Dr. Senn was mentioned. No man has been able to make possibly more money out of the practice of surgery than Dr. Senn has done, and great credit is due him for what he has done for the medical profession. But he has had independent means aside from his surgical practice, which pays far better than the practice of dentistry; and I doubt today whether Dr. Senn could make a chemical or microscopical diagnosis of a disease and feel that it was accurate, because that work has been left very largely to others whose business it is to do this class of work, and what he has done in research work has been along the mechanical lines of his profession. He has developed many things of value in connection with surgical operations. They are of great benefit to surgeons, but practicing dentists have done equally as much or have brought about greater things in their field in many respects. The Griswold attachment is a mechanical device which was evolved from practical ideas. That is all that we can hope to do in dentistry—to evolve certain practical or mechanical things that would be of great utility to us in everyday practice.

As for men outside of dentistry doing dental research work, it is not feasible unless they have had good dental training, or unless they are constantly in contact with men who are engaged in the active practice of dentistry, so that they can become acquainted with all the conditions of the mouth and teeth. I think Dr. Hinkins will bear me out in saying that while last year he had associated with him an expert chemist, he could not have accomplished anything if he had not been every day in contact with Dr. Hinkins in the work he was doing. He suggested many things from a chemical standpoint, but from a truly dental standpoint he had not the slightest idea of what the profession wanted, what they would expect, nor what the results would be when the work was accomplished. If research work for the benefit of the dental profession is to be accomplished, it must be done by men, even though they devote all of their time to research work, who will keep in close touch with the dental literature, with the ideas of up-to-date dentists, and see every day, if it is possible, the things pertaining to the practice of dentistry. Such a suggestion seems impractical at this time. A thing that would be the most benefit to us as a profession would be, if it could be brought about, to establish a dental chair in a university somewhere, where the dentist may have access to laboratories which would not cost him anything. I think possibly most any university would be willing to give a dentist room in which to work, apparatus to work with, and be under the supervision of some of the head professors. He would there have an opportunity not only to come in direct contact with the best thinkers upon certain lines, but he would naturally come in contact with the men engaged in other departments of science, like physics, chemistry, geology, etc., sciences that must have some bearing on any scientific research that may be undertaken. If a dentist could have a place in such an institution, with the aid of apparatus, and surrounded by such men, he would certainly be able to clear up some of the problems that are more or less obscure now in regard to dental lesions.

Dr. T. W. Pritchett, Whitehall, Ill.:

I wish to thank the Society for the invitation extended to me to be present and listen to the president's address. I have enjoyed it very much, and I consider it a privilege to have been present and listened to it.

The only thing I regret is that seemingly there is a difference of opinion among you. This is rather surprising to me. It seems that there are two kinds among you. One you call nestors, and the other kind the essayist did not name, so I do not know what you are.

With reference to the remarks made by my friend, Dr. Damron, I will say that we nearly always agree, but that we disagree when we choose to and each one has his say. But I am thinking of this: You can not hide your light under a bushel. With the means you have of having your proceedings reported and published in dental journals, you are talking to everybody in the dental profession. I have read all of the papers of which your president this evening gave résumés in The Dental Review, consequently I am more or less familiar with the subjects that have been spoken of. The beauty of your meetings is that we all belong to you, so to speak, because we have the opportunity of reading what you say. Your papers and discussions are published in The Dental Review.

Again, I wish to thank you for the opportunity of being present, as I have appreciated what has been said, both in the address of the president and by the gentlemen who have so far taken part in the discussion.

DR. L. S. TENNEY:

I do not suppose that a general discussion of Dr. Woolley's address is necessary, because the papers that have been read during the year have been discussed by each one of us as far as we cared to discuss them, and it seems to me the point upon which he dwells and and wants to have discussed is the subject of appointing some one or body of men to institute and carry on original research.

You know that a meeting is never interesting if we all believe alike and take the same stand upon the subject, and so for the purpose of eliciting a little discussion I will throw in some discordant views. I sometimes wonder, if we were to have such a body of men appointed for the purpose and engaged in research work in our profession, whether our hopes would be realized, and whether our expectations would be fulfilled. There is one thought that came to me as I listened to this discussion. Some one has said that the world moves forward in proportion to our ability to take up the work where the preceding generation left off. And I think if we study the lives of great men of history, those who have stood out like mountain peaks, we will come to the conclusion that those men, after all, only crystalized the knowledge of their day. Napoleon was the exponent of the military spirit of his age; Angelo was the exponent of the artistic spirit of his age; Shakespeare was the exponent of the literary spirit of his day. Black, Miller, are the exponents of the scientific spirit of the age in our own profession. So the world moves forward, not through the efforts of any one man or any few individuals, but through the general diffused knowledge of all mankind. So I say, if men were appointed for this purpose, I wonder, after all, if the results they accomplished would be all that we desire.

Of the things that have made an impression upon my mind, one was a remark made by Dr. Damron, who spoke of the pleasure and joy of mingling with his fellow dentists and gathering ideas here and there.

Another thing was a little conversation I had with Dr. Cook, who had a large volume on physiological chemistry which he was carrying. I opened it and found a lot of mysterious looking symbols, and I said to Dr. Cook, how little any one of us can accomplish in a lifetime. Suppose we should by hard work, day and night, know everything that is contained in this one volume, how much we would accomplish. He said, "No; if you knew everything in it, it would not do you very much good, because," he says, "knowledge consists in helping to find out knowledge. If you knew all there was in that book and could repeat it by rote, it would not do you any good unless you could apply it to the work in hand." We can progress in the future as we have in the past by gathering ideas, and with such men as Drs. Cook, Black, Miller, and Williams, who are not so far superior to us all, but who have simply gathered in the knowledge that has come through thousands of sources, crystalizing and holding it up to our view, we must expect to make even greater progress. So that I do not believe we could attain all we hoped to attain by the appointment of such a body of men to do research work.

I want to say in complimenting Dr. Woolley that I never knew a man to be more earnest in his work, more devoted to his duties, and more sincere in the task imposed upon him. I have been in a position to witness some of the work he has been doing. I have had him come down to my office with his hair standing on end, wanting to know if everything was arranged for the meetings, and I feel that the Society owes a debt of gratitude to him for the sincere, careful, conscientious manner in which he has discharged his duties as president of our Society.

Dr. C. N. Johnson:

So much has been already said in regard to the earnestness and devotion of our president to the interests of the Society, that it is only necessary for me to say I endorse everything that has been said by the members. He has not only been faithful during this year, but he stands on record as one of the most faithful attendants in this organization.

I was especially pleased to have him make a résumé of the work of the Society during the past year, because while I have come in close contact with the matter brought before the Society as no other one man, in editing it for The Dental Review, the salient points that have been brought out in the papers and discussions during the year have been refreshing to me.

In regard to the scholarship Dr. Woolley mentioned, or the establishment of a chair in a university for the purpose of dental research work, I do not believe it will ever be placed on the basis that he hopes to see it until we become older as a profession, and as a nation. If we look back at the advancement made in the medical profession in original research work, we will find that it has been done by individuals largely, with the possible exception of Germany, which fosters by governmental control or supervision original research work. Our nation has not grown quite old enuogh yet to have that spirit of research work infused into it, although it may come in time. I think if we have anything done along that line, aside from the work done by dentists themselves, it must have the paternal support of the government.

I remember, and I have thought of it a good many times this evening, several years ago *The Dental Cosmos* published an editorial suggesting that a fund be raised by which Dr. Black might drop his practice and enter heartily into original research work for the benefit of dentists, and inviting in that editorial suggestions and the promises of contributions to such a fund. I, myself, wrote to the editor volunteering contributions and encouraging him in the movement. Some time afterward he wrote me saying that he had received one other letter aside from mine, and later I understood that these two letters were the only ones he had received. I believe, if we expect to raise a fund for this purpose, it must be done by personal contact; it must be done by personal solicitation; it must be done, as Dr. Pruyn has said, on the basis of an enthusiasm for the work and a willingness to support the work.

I must take issue with a certain trend of thought this evening. I know that the practice of dentistry is an exceedingly exacting calling, and yet I do not know of any other one body of men who have such an absolute control of their time as do dentists, and I believe that a dentist, who has a full practice, still has time for original research work, if he has the capacity and ability, if he has the enthusiasm Dr. Pruyn has referred to for that work.

I have often wondered what dentists do with their evenings. In looking back over my career, if somebody had taken me when I was a boy in the profession and had pointed out the possibilities of research work, I know I could have found any number of hours in a week that I could have set aside for original research work. We ought to imbue the young men in the profession with the spirit of original work. I have great hope for the future of our profession if we will impress the young men who are entering the profession with the possibilities of such work. I think we have done well as a profession, and I am glad the president brought this subject up, because we need agitation of this kind. There is a spirit of that kind now in the profession. He mentioned a gentleman in New York who has donated a thousand dollars a year for that purpose. A society in New York City has offered some excellent prizes for papers on original work. All these things are working together for the advancement of the profession, and I believe it is along those lines rather than by the establishment of a special chair in a university that will bring the results.

DR. E. J. PERRY:

With reference to the establishment of a chair for original research work, I will say that on several occasions Dr. Woolley has spoken to me about this. He has poured into my receptive ear what he would like to see done, and I have decided that when I leave this terrestial sphere I would endow such a chair. Not long ago I had a dream that I had returned from the Klondike very rich, and that I was about to endow such a chair as our president has alluded to. But, after all, it was a dream.

Dr. Woolley is so earnest, so enthusiastic and sincere that I must say his inspiration has been a great help to me. Whenever I come into the presence of enthusiastic, earnest, honest, open-hearted brethren in my profession I always have power and strength, as I feel that I am such a frail sort of mortal professionally. I am glad to say that our retiring president, Dr. Woolley, through his inspiration has helped me in the year that has passed.

DR. L. L. DAVIS:

I heartily concur in everything that has been said with regard to the earnestness, the enthusiasm, of our president, Dr. Woolley.

While he has intimated to me that he has no established theory as to how he is going to obtain what he wishes to establish in the way of a chair of original research work, still he is of the opinion that the proposition is feasible. Tonight we have heard both sides of the question, and I think the position taken by one of the recent speakers on the subject is probably the best, namely, setting aside a certain sum by this Society or societies for undertaking this original research work. We can probably get at the matter better in this way than in any other manner.

I read a recent address by Dr. Nicholas Senn, and he spoke of the fact that he could not understand how medical men could indulge in playing golf, poker, or in playing cards; that his time was all occupied with work; that he never took any vacation, and that he has always been wrapped up in his work. Unless you can find men of that kind in the dental profession, I fear very much will not be accomplished. It is only such men that do original research work and do it all the time. But it is difficult to find a man who is willing to devote not only his entire time at the dental chair during the day, but his evenings and spare moments to work that will help the profession and dentists generally to accomplish what they all desire, and the only way we can help such men in doing that kind of thing is by our dental societies offering certain sums of money that will serve as incentives for the men to work along these lines.

DR. C. R. TAYLOR, Streator, Ill.:

I would like to break the box of alabaster over your president's head and anoint him with the oil of gladness, because I have known Dr. Woolley for a long time.

As to the question of establishing a chair for original research work, I have an idea as to how such a thing can be done, and I believe it is the way in which it will be accomplished. Dr. Cook has made an excellent suggestion this evening in regard to research work, and that is, that one science depends upon every other science for its completion or development. And so in research work of a particular kind we must depend very largely upon associate research work, and this must come through established institutions, such as a university or a State institution.

I remember years ago an old abolitionist. He was a queer old duck. He was very erratic and as impractical as any man could be so far as life was concerned. But in the matter of education he announced a proposition I have thought of a great many times, and that was the kind of education that the American people needed to carry on their best interests. He said that the State itself should give education to each of its citizens, such education as the citizens were capable of assimilating and the life of the individual required necessary to fill his calling. So I believe that all callings should be fostered by institutions that are endowed either by individuals or by the State. I am enough of a socialist to believe that the State must provide its citizens with an education sufficient to carry on the best interests of society. I believe that is the final fundamental principle which this country must have in view and adopt, and that we will never have a proper dental institution until it is a State institution, with enough wealth back of it to carry on the investigation and research work that is required. But before this time comes there must be growth, and the only way success comes is by growth. We can not force it much. We may have rich men like Carnegie, who can find a Burbanks from among us to assist us in this movement; but those men must prove their worth by a striking personality before being selected for special work. They must be men who appreciate the importance of original research work, and then by selecting the proper men to do such work, I have no doubt great problems in dentistry will be solved, and questions that are now doubtful will be cleared up.

Some one has said that "The greatest happiness is founded upon the highest wisdom." That is a profound truth, and if we could instill it into our souls and into the minds of our young men who are entering our dental institutions we would do a great deal of good.

Such men as Black, Cook and many others are doing a great deal for the dental profession. I know of the kind of work that Dr. Cook is doing. I know that he drinks somewhere at the fountain of knowledge, and that he brings his knowledge to the dental profession, and in so doing he is not only enlightening them, but is doing himself great good.

The longer I live, the more I appreciate the fact that the greatest thing in life, after all, is one of service and sacrifice somewhere along the line. Some sacrifice themselves to the ill and bad; others to the good, noble, and inspiring. That is what we ought to strive for.

Dr. W. E. Griswold:

In sitting here tonight my mind went back to a period of fifteen years ago, when I began coming to Chicago two or three times a year to attend dental meetings, and during that time I was the guest of the members of the various societies. I remember very well the last time I attended a meeting of this organization. It was at the Chicago Athletic Club. We sat at a round table and we had a good and profitable meeting. I have gathered many ideas from attending these meetings. They have been an education to me. I feel that I am dependent to a certain extent on Chicago and its representatives in our profession. I have looked upon Chicago as the hub of dentistry. I have attended many meetings of a similar nature, both State and local, in various parts of the United States, but nowhere have I ever listened to more able papers, better discussions, better clinics than I have listened to and witnessed in this city.

I wish to thank Dr. Wassall for inviting me to attend this meeting. I have enjoyed it very much. I have also enjoyed the president's address.

Dr. C. S. Case:

I am pleased to know that the members of our Society think so much of Dr. Woolley. I feel very proud to know that both of us came from Michigan, and that we knew each other there. I certainly can voice all that has been said about him tonight.

His paper was an excellent one, and I am sure we all enjoyed it, and as a society I think I can voice the feeling and sentiments of the others when I say that we have also had great enjoyment this evening in listening to the various speeches that have been made by the guests that have appeared before us.

In regard to the question of original work which our president has suggested, and which seems to be his main desire, I do not know that I understand exactly what is meant by original work. It has always seemed to me that original work in any profession depended upon whether or not there was advancement by it, as, for instance, in the treatment of diseases of the teeth, etc. This is a big question. Reference has been made to one man pursuing this original work, and if he arrives at or obtains any great results it must be a very peculiar mind. He must be a man of great ability, one who has ability beyond most men in the dental profession, because we are having original work done by great men in the dental profession today; men who are not only able, but are very enthusiastic. It is not because they are paid for it, but because they have a love for it, and original work can never be done successfully unless it is done by enthusiasm and love for the work itself.

Besides, to do original work it must spread over a variety of conditions, a vast field, which it would be impossible for any one man to cover. It would necessitate a large number of men. When we attain any great success in any special department, I find that it takes a great many years of experience, ability and contact with practical things, continually classifying this and associating it with other things that are practical in a man's best practice. And it seems to me that applies to a disease as well as to anything else. I can understand how one man can pursue original work in a certain line. It may be a medical line; it may be in a chemical line. One may be able to take the secretions of the mouth and analyze them thoroughly and take them from certain diseases; but it seems to me it must be associated constantly, as has been said far better than I can express it, with practical things that rise out of conditions of practice. These things can only be done by men who have very large practices and see a great variety of conditions. I hardly think it is a practicable thing to expect one man or a number of men who are not in active practice to attain any great success in that line.

DR. J. E. HINKINS:

It is needless for me to say that I admire our friend, Dr. Woolley, because since I first entered the profession I have always considered him one of our friends, and he is respected and honored by all.

I have enjoyed very much his résumé of the year's work of the Society. He spoke to me several times about this question of original research work, and I must say frankly that I agree almost entirely with Dr. Cook, because we have burnt a good deal of midnight oil together. I agree with what he has said when it comes to the question of men to do special original research work. It is hardly possible, but probable. In the first place, the man who undertakes this work has got to be very well informed. He should be a man of general knowledge, of special knowledge. He has got to be familiar with the physiological as well as the pathological conditions of the mouth. He has got to be a man who is well trained in modern technique, and should be familiar with the methods of our universities of today. He has got to be able to read French, German, Russian and Italian literature, because many of the best scientific articles are printed in these languages, and of which many of us know very little. When we come to work in chemistry, and go through our American chemistry, it seems like only the elementary part. If, on the other hand, we go into organic chemistry, we can hardly realize the number of books that are written in German alone. When we go into Russian and French literature we find the same thing holds true.

Miller and Black have been referred to. These men have done great work for the dental profession. They have confined their work very largely to bacteriological work in the mouth. But who can tell what kind of gases and what kind of acids are found in the mouth? this question has not been settled. We have not got a man in the dental profession who can do it. I do not know of any one who can. I have done a good deal of work along this line myself, and I must confess that I know little or nothing about it.

In order that research work may be carried on properly, I believe it should be done under the auspices of some university or universities, where the man who undertakes the work can have the use of laboratories for this purpose and be associated with other men.

I believe that if anything is to be accomplished in this direction it must be done by a number of men rather than by any one man, and those who undertake the work must be enthusiastic, hard workers, and faithful, giving us their honest results as they find them.

Dr. Woolley (closing the discussion):

As it is getting late I shall only detain you for a short time. In the first place, I wish to thank the members of the Society for the manner in which they have discussed my address, and for the kind things they have said about me.

The subject is so large that no one can cover the whole field; but if I have brought before you some thoughts which will cause more or less agitation in the matter of research work, whether it be done by one individual appointed for that purpose or several, my suggestions will not have been in vain. It may be the means of stirring up the profession at large; it may be a stimulus for members of our profession to engage in research work in their special lines. Each man at work in dentistry must be in earnest, faithful, enthusiastic. He must show something for his work, whether it is in the direction of original investigation or not.

I hope something will come out of this evening's discussion. What we need in dentistry is some great man, like Napoleon, to formulate some great plan, some great scheme, which will help not only the dental profession, but the world at large.

Thanks are due to The Dental Review for its valuable reference, as I would have been unable to have made much of any résumé without help in this direction.

THE CHICAGO ODONTOGRAPHIC SOCIETY.

A regular meeting of the Chicago-Odontographic Society was held in the Chicago Public Library Building on Tuesday evening, November 21, 1905, at 8 p. m.

Dr. W. H. Taggart, president, occupied the chair.

Dr. John Q. Byram, of Indianapolis, Ind., read a paper entitled "Some Phenomena Observed in Fusing Porcelain."

DISCUSSION.

Dr. J. E. Nyman:

Mr. President—It has been with peculiar interest that I have awaited this paper. I knew that Dr. Byram was carrying on a line of experiments from which I felt conclusive deductions would be drawn. I knew also that in a vague way he felt that the fusing of porcelain was, to a degree, a chemical process, but at the time I had a chat with him he had only started on his experiments, and had not carried them out to the point where he could draw definite conclusions.

Perhaps some of you who attended the State meeting at Moline will recall that in an inadvertent way, quite aside from the subject under discussion, while discussing Dr. Goslee's paper, I happened to make the remark that I felt that the fusing of porcelain was a chemical process. A gentleman who works a great deal with porcelain differed with me and said that he thought it was almost entirely a physical process. Two gentlemen got up and insisted that I repeat what I said, and one gentleman said that he wanted me to go on record right then beyond all peradventure of a doubt. I did, and I am not sorry that I did. One of the gentlemen has since told me that he thought my remarks on the subject the greatest lot of rot he had ever listened to, and that he had settled the whole question before I ever practiced dentistry. I took occasion to invite those gentlemen to open the discussion of a paper which I had intended to read at the next State meeting. My good friend, Dr. Byram, has relieved me from carrying on another line of experiments. Dr. Byram has given the composition of porcelain as nearly as it probably can be given. Each manufacturer of porcelain has his own special process in which the relative proportion of silica, feldspar and kaolin all vary somewhat. In almost all the preparations we find a certain percentage of starch or gum tragacanth; that is to hold the mass in shape. Feldspar, besides adding to the translucency, also gives it the necessary heat induction which is essential in eliminating the possibility of fracture in cooling. It has been claimed time and again that the fusing of porcelain was the fusing of feldspar and the flux holding in combination the more infusible kaolin and silica. That is a little difficult to demonstrate, because most of the porcelain we use fuses far below feldspar and far above the fluxes. If that were the case, and if the flux merely remained as flux to hold the more refractory parts in position, the flux would all burn out.

I have tried all the experiments that Dr. Byram has tried with the exception of that relating to the attempt to fuse porcelain upon gold. I know that he is right about what he states in regard to the peculiar phenomena in fusing porcelain. If I had not tried it, I would believe it because John Quincy Byram said so.

Another thing which to my mind is evidence that the fusing of porcelain can not be a physical process entirely is owing to the fact that we get color changes according to the degree of fusion to which we submit the porcelain. You can not change the color of any mass without adding to or detracting from the volume of the mass except by chemical process. When we lighten the color mass without adding anything to it, we have done so on account of some chemical process that has gone on. You all know that burning is always a chemical process, still there are always a few phenomena to be observed which lead me to believe that to a degree the fusing of porcelain is a physical process. Now, I do not pretend to say to just what extent the fusing of porcelain is a chemical or a physical process. I do not pretend to say it is 80 per cent chemical and 20 per cent physical. What leads me to think it is not wholly a chemical process is the action of hydrofluoric acid upon the porcelain. If you submit the surface of porcelain to the action of hydrofluoric acid and afterward wash out the acid, you will find upon examining the porcelain dust with a magnifying glass that the hydrofluoric acid has not attacked that mass in a uniform manner. There are little places which seem to have withstood the action of the hydrofluoric acid to a greater degree than some other places. Now, if it were a uniform chemical process, I feel that the hydrofluoric acid would have attacked the surface evenly all over.

I have here two little specimens that to my mind are rather significant. I took two masses of porcelain of nearly even weight and put them through the furnace and took them to the biscuit point; one I laid to one side. No. 2 I put through the furnace six times more and only took it to the biscuit point. I know I only took it to the biscuit point because I had a control piece in each time and yet after exposure each time to the biscuit point we get a most beautifully glazed bit of porcelain; in fact, the porcelain is slightly overfused.

Gentlemen, I feel that it is a matter of congratulation that we have in our profession a man like Dr. Byram, one who is so situated that he can carry on experiments without pecuniary loss to himself. Further than that, Dr. Byram seems to have the attributes which are essential to an investigator. It is not given to every man to recognize facts when he sees them, and fewer still can draw logical deductions from the facts. I feel that Dr. Byram embodies these attributes.

Dr. J. P. Buckley:

Dr. Byram, in his characteristic Hoosier fashion, has discussed this subject in a manner which is indeed pleasing to me, because if I had had the time to devote to the study of fusing porcelain, which I have not, being more directly interested in the treatment of diseased conditions, and to experiment as Dr. Byram seems to have had from the remarks of Dr. Nyman, I would have taken up the same phases of the question which he has considered tonight.

Now, if I confine my remarks to the limitations of the paper, there is only one question to be discussed, and that is, whether or not the fusing of porcelain involves a chemical change, a physical change, or both. It seems to me to doubt that there is a chemical change taking place in the fusing of porcelain is to admit our ignorance of chemistry—a science which treats of the composition of matter, the changes which take place in matter, and the laws governing those changes. There can be no question but that there is a chemical change in some of the original constituents in the process of fusing, but whether there is a change in all of the various constituents or not is another proposition. If I might be permitted to use the language of my esteemed friend from Philadelphia, who is ever ready and willing to criticise me, I would say that while I agree in a general way with the ultimate conclusion of Dr. Byram, I do not agree at all with the line of reasoning by which he arrives at that conclusion. I would say that "the major premises involved in this hypothesis are faulty." Among the things observed by Dr. Byram in this fusing process was that porcelain fuses at a lower temperature each succeeding time that it was fused, and he reasoned that if the flux burnt out, it ought to fuse at a higher temperature each time; but as I say, he observed that it fused lower, therefore a chemical change must take place. Here is what I am getting at: The question arises in my mind, does the flux burn out? What is the flux? Sodium and potassium carbonate, Dr. Byram has told us.

Another thing I want to state is that when the porcelain is porous the porosity comes from the fact, according to the essayist, that you fused it so rapidly that the gases did not have time to escape, which gases are "carbon dioxide and other gases." If it is a fact, and I don't know whether it is or not, because these manufacturers are not prone to tell us much about their processes, but if it is a fact that the manufacturers fuse the original constituents of the porcelain and then powder the fused mass and sell that powder to us, with the things that Dr. Byram has put in his porcelain, it is absolutely impossible to have any carbon dioxide escape in fusing, because you can not get any carbon dioxide unless you have carbon. If Dr. Byram is correct in his composition of porcelain, the sodium and potassium carbonate have been broken up by the manufacturer in the original fusing, and now we have the oxides of potassium and sodium, or the compounds with which they have united, when it comes to us.

Now, on the other hand, porcelain can not be a definite chemical compound. Dr. Nyman has experimented a little, he says, with hydrofluoric acid which etches some parts of the porcelain more than other parts. Manufacturers make no attempt to put the constituents into this body so that when fused they will unite in definite proportions. You can not have a definite chemical compound unless you have a definite amount of the various constituents which are supposed to enter into that compound. For instance, if you heat iron and sulphur in a suitable vessel, protecting the iron and sulphur from oxidizing during the process of heating, the only way you can have a definite chemical compound formed as a result of that heating process without having an excess of sulphur on the one hand or of iron on the other, is to take the iron and sulphur in definite proportions. You would have to take 56 grams, the molecular weight of iron, and 32 grams, the molecular weight of sulphur, put them together, and then protect them so that you would not lose any by oxidation. When you heat that, you will have iron sulphid formed and nothing else. The manufacturers make no attempt to put silica, feldspar, kaolin and flux in their porcelain body so that it will combine in definite proportions. Of course, there is a chemical change involved. To doubt that, you admit that you do not know anything at all about chemistry. It seems to me that what you ought to discuss is whether or not fused porcelain is a definite compound, and there can be only one answer to that. It is not a definite compound.

I would like to attempt to explain perhaps why, or in my opinion at least, why the porcelain fused at a lower temperature each succeeding time it was fused. I don't believe the flux burns out. You can change potassium carbonate to the oxid, but I don't think you can burn this constituent out of the mixture. By burning out, I take it that he means to get rid of some of the potassium that entered into the original body as carbonate. It may be that the reason that the porcelain fuses at a lower temperature each succeeding time it is fused is because in the original fusing of the manufacturer, the potassium carbonate is changed to potassium oxid, and when you heat this porcelain that the manufacturers sell to us, you fuse the potassium oxid perhaps into the silica, making silicate of potassium, or you may fuse it into the kaolin, making feldspar. Now, if you change some of the kaolin or silicon dioxid by means of the heating process into chemical substances which fuse at a lower temperature than the original substances, then you know why the whole mass fuses at a lower temperature. From the little time I have spent on it, I believe that is what takes place; that is, that you make feldspar out of some of your kaolin or you make silicate of potassium out of some of your silicon dioxid.

It seems to me that Dr. Byram could have saved a great deal of time if he had experimented along other lines, if his sole idea was to find out whether a chemical reaction took place in fusing porcelain. If he had taken a certain portion of porcelain and subjected it to the solvent action of some liquid, say water, he would have dissolved out any soluble constituents. Then, if he had fused a like amount of porcelain and powdered it, and subjected that powder to the solvent action of the same agent and tested the amount of material which was dissolved out the first and second time he subjected these two powders to the solvent power of water, he would have found out whether some of the soluble constituents of the original porcelain were changed by the fusing process into something which is insoluble. That is all that would have been necessary if the only thing he is trying to find out is whether a chemical change takes place. There can be no doubt but that there is a change in some of the constituents of the porcelain body. There may be some doubt about some of these constituents combining with each other in the fusing process.

Mr. Robert Brewster:

In an excellent, though somewhat short paper, Dr. Byram has given us the results of much labor and investigation upon the fusing of porcelain. In discussing the paper, I have taken the liberty of committing my remarks to writing so as to economize the time of the meeting.

With your permission, Mr. President, I will read from these notes.

The essayist very properly claims that correct fusing is as important a part of porcelain work as any other, and that insufficient attention has been given to this part of the subject.

The large majority of users of porcelain who do not make themselves familiar with the character of porcelain or its working qualities, but just use it from day to day in the regular course of practice, without any attempt to discover the real cause of occasional failure, should be thankful to the essayist for the investigation and labor involved in the paper presented tonight. I can not, however, agree with the essayist when he states that "in order to understand the principles of fusing porcelain it is necessary to consider the ingredients of which it is composed"; a knowledge. even a perfect knowledge, of the exact ingredients of a mix of porcelain is of no help to the person fusing the material. The operation is purely mechanical, in the sense that the person watching the fusion withdraws the heat, or withdraws the material from the heat, when they observe that a given condition of the material has been reached. Therefore, a person quite unfamiliar with the component parts of the material may, by giving close attention to the operation of baking, obtain perfect results.

To insure perfect results, however, the question of the baking oven or furnace must be taken into consideration. The essayist has used a pyrometer furnace in making his experiments. Pyrometer furnaces are valuable adjuncts and especially useful for experimental purposes, but it may be safely stated that any open-mouth furnace, closed only by a mica door, whether connected to a recording meter or not, is an imperfect baking instrument, it being quite impossible to maintain a uniform heat in all parts of the muffle, and I attribute many of the errors in fusing porcelain to this cause. The mica covering the wide opening to the muffle allows of a continuous escape of the heat, and it also quickly loses its transparency, necessitating its frequent temporary removal to ascertain the condition of the work within the muffle; each time the mica is removed a further escape of heat occurs, producing conditions very detrimental to correct fusing of porcelain. For a long time past, I have discarded the use of mica in such furnaces in favor of clay doors. The ideal furnace is undoubtedly one in which the muffle, when the work is placed within it, is as nearly hermetically sealed as possible.

The first furnace I ever saw approaching this ideal requirement was made by your president; the second was made by Dr. Roach. In the former case, Dr. Taggart, I believe, uses a clock mechanism to break the electric current when the required heat has been reached. The muffle, as will be understood, is never opened until the work is to be taken out. In the Roach furnace, the melting of a pellet of metal breaks the electric current.

The action of these automatic furnaces, viewed from the practical standpoint, disposes of the theory that "porcelain has no definite fusing point." They also demonstrate the correctness of the view I have so frequently urged, viz.: that the correct method of fusing porcelain is to increase the heat steadily and continuously from a very low temperature to the final fusing point.

Your essayist has shown by his experiments that porcelain which may be properly fused in five minutes by a gradual increase of heat up to a definite temperature, will also fuse by long continued heat of a lower temperature, indicating that the chemical changes brought about by the application of heat may be produced in either of the two ways mentioned. The practical point gained from these experiments lies probably in a timely caution against the too rapid fusing of porcelain.

Furnaces with closed chambers of the nature of those I have mentioned, in which the heat increases by regular gradation, will be the baking ovens of the future. They do away with the personal element, and consequently tend to more uniform results.

The essayist mentions that the color of underfused porcelain is dull. This is due to the fact that the coloring pigment is prepared in the first place to fuse at a definite degree of heat; if that heat is not reached the full tone of color is not produced, and if the heat is carried much beyond the correct point, some of the color fades.

In the deductions reached by the essayist as the result of his investigations, he mentions that low fusing porcelain can be made of high fusing by repeated fusings and grindings. I believe it will be found that in subjecting high fusing porcelain to this treatment that the vital characteristics of high fusing porcelain, viz., holding its form and color, are almost entirely lost.

The essayist is doubtless correct in saying that the fusing of porcelain is largely a chemical reaction. It is physical only in the application of heat which brings about those familiar changes of form and structure of the mass, while at the same time producing varying chemical formulæ which are dependent upon the heat reached, and by the quantity of oxygen, carbon, sulphur or other gases present in the heat.

It might throw some light upon this subject of chemical investigation if I say that nearly all of the porcelains that are made differ somewhat in their composition and method of production. Some of them have fluxes incorporated with the basal materials in the course of their manufacture, and in other cases the fluxes are added after the body is prepared. You will find in treating the different porcelains that you will have that difficulty. There is another point that you will notice as you investigate the matter further, and that is, that as the number of fusings increases and as the heat is increased, the mass reduces and the weight reduces. This is a point for the chemist to explain. There must be some loss of some of the ingredients due to the higher heat to which the mass is subjected.

I would like to say that in regard to the gravitation of color that there is a difference upon the surface and in the center of an old baked piece, but that is not due to the gravitation of particles of color, because as the color is the same composition as the body, it would be impossible for the color to gravitate toward the center. Your whole mass is overfused. The presence of extreme heat on the surface will reduce the color. You will notice that very often in ordinary teeth, because if you place the edge of the teeth too near the source of heat it will bleach that point, and the intense heat sufficient to overfuse it has faded the color.

Dr. G. W. Cook:

I don't know why I should be called upon to discuss this paper other than perhaps because I mentioned to one or two of my friends that I had done some fusing of porcelain at different temperatures in the laboratory at the Chicago University. I fused some of the high fusing bodies at low temperatures and found practically the same thing that Dr. Byram brought out in his paper, and I came to the conclusion that the difference in the color when it fused for a long time was due to the changing of the color matter in different places in the mass.

Now, the fact has been settled, apparently, that it is a chemical process. Mr. Brewster has stated that we have definite quantities. There is such a thing in chemistry as what is known as "mass action," a reaction in chemical processes according to the mass of material. While we might say that it is not a chemical process, still the question I would like to know is whether it is porcelain until it is baked. We have a compound of materials put together mechanically, but we do not call it porcelain until it is baked, and consequently, we have a new compound, the process being brought about in a physio-chemical manner. It may be that the substances that compose that mass during the process of fusing are physical elements, but the mass itself is a chemical compound. You have a so-called mass reaction. It is a process it seems to me that would be worthy of further study if anyone would care to take up the subject in such a way as to determine just what changes take place, but there is no question in my mind that if you have a rearrangement of your atoms and molecules you have a chemical change. It is a rearrangement, and the baking of the body is a physio-chemical process. You have all the ingredients there but you have a changed mass. Dr. Nyman has aptly mentioned the conditions under which we have this change brought about. I have observed that the long axis of the mass contracted and the short axis expanded when you raise the temperature to a high degree.

Now, the changing of the color in the mass, to my mind, is due more to the movement of the molecules in the mass than it is to the burning out, and when you raise the temperature, you change those molecules and the coloring matter sinks or gravitates toward the center under high pressure, the tendency of the mass being to globulate. This is true of changes that take place in the inorganic world.

Dr. F. E. Roach:

We are certainly to be congratulated upon having Dr. Byram with us, and I am sure we all appreciate the efforts the doctor has made in this work. While I have not made a study of the subject from a chemical standpoint, I have had some experience in the use of porcelain and its practical application. Dr. Byram has gone into the subject from the scientific point of view, and I hoped that when I came here this evening that we would have the question settled as to whether the fusing of porcelain is a chemical or a physical process. Dr. Byram's conclusions were that it is chemical. It was further verified and apparently settled by Dr. Nyman, but when Dr. Buckley, who has the faculty of going into matters so thoroughly from a chemical standpoint, got through with this phase of the subject, he made those of us who are not familiar with chemistry feel that we know but little about the chemistry of porcelain.

I am not feeling well this evening and I hope you will excuse me if I take my seat without exposing my ignorance of this subject.

Dr. J. H. Prothero:

There was some curiosity, as well as an element of doubt in my mind, that prompted me at the State meeting to question Dr. Nyman's views in regard to the fusing of porcelain being a chemical rather than a physical process. In his offhand way Dr. Nyman said, "You all know the fusing of porcelain is a chemical process."

He did not give any definite proofs at that time, and while the idea is not a new one to me, yet the lack of evidence, based upon carefully conducted experiments, proving that chemical changes do occur, inclined me to adhere to the old theory, that the feldspar, under the influence of heat, fused and acted as a flux, uniting the more infusible ingredients together, and that the process, therefore, was physical rather than chemical.

Dr. Byram has devoted much time and energy in experimental work along this line, and has presented a number of important physical proofs, which tend to prove that chemical changes do occur. What these changes are he says he can not positively state, but he mentions some of the reactions which most likely occur, and which I think are sufficiently logical to justify the belief that there is some chemical as well as physical process involved.

Dr. C. D. Lucas, Indianapolis, Ind.:

Considering the fusing of porcelain, it seems to me that there has been proof brought out this evening that the process is both a chemical reaction and a mechanical union. If porcelain could be analyzed and the definite proportions of each ingredient determined, then we could figure out a definite chemical reaction. If we can not do this we can not demonstrate that the process is a definite chemical reaction. Dr. Buckley says the potassium carbonate and sodium carbonate are changed in the fusing process by heat, so we are sure they are changed chemically. The mechanical union is simply the embodiment of the non-fusible substances in the fused substances.

I have made no experiments along these lines but have observed Dr. Byram's experiments. I wish to say that Dr. Byram's time is devoted to different phases of college work and he has not so much time to devote to this work as some of you may think. The paper and the discussion has very clearly demonstrated the fusing of porcelain to be both mechanical union and indefinite chemical reaction, rather an unknown chemical reaction.

Dr. Byram, in closing the discussion, said:

When I was informed that my friends Dr. Buckley and Mr. Brewster were to discuss this paper, you can readily imagine my embarrassment. Having no practical knowledge of the manufacture of porcelain and knowing nothing of chemistry, I have been handicapped from that point of view.

Now, with reference to my friend Dr. Nyman, I want to say that it is our custom to throw bouquets at one another. When he came to Indianapolis to read an excellent paper on the subject of cavity preparation I really tried to pay him a compliment, but he got up and said that I ought to change my name from John Quincy Byram to John Blarney Byram. I would say in his language that he should change his name to John Blarney Nyman. I am frank to say that I can not attack Dr. Buckley as I should like because he would fire back at me and expose my ignorance of chemistry. He gave one or two illustrations, and now I shall give one: We all know that if we take nitric acid and add silver to it it will take several hours or days to dissolve much of the silver, but by putting it over a burner the chemical reaction is increased. To take his own illustration of sulphur and iron; if it were heated a few minutes there would be a certain amount of chemical reaction. Let it be removed from the fire and place it back again the next day and there will be additional chemical reaction. If the heat is continued long enough there would be a chemical action going on until all of the iron or sulphur had been consumed. That is what I was trying to show. When a manufacturer adds these fluxes to porcelain, what does he do? If he applies heat, that does not necessarily mean that he has heated it until all the carbon has been formed at that particular time, does it, Dr. Buckley?

Dr. Buckley:

Yes. You can not heat the carbonate of any metal without taking it up at once. They are very unstable.

Dr. Byram:

That would be true if you were to take it alone, but would it not be possible to do that when it was combined with other elements? I have talked with two chemists and they say it would. I took their word for it. It is up to them and Dr. Buckley to decide that point.

It was not the principal intent of the paper to bring out all this discussion as to whether the fusing of porcelain is a chemical or physical process. I tried to show in as clear a way as I could by this series of experiments that certain results were obtained under certain conditions.

We, as scientific men, must not take the manufacturers' word for these things, but we must experiment for ourselves, and if we do not, we certainly are not scientific men but are working on the plane of the common mechanic.

If you heat porcelain rapidly, what is the result? It begins to glaze on the surface and not in the center, and we have a liberation of gas which can not escape, and have bubbles through the mass. I have examined teeth of manufacturers under the microscope, and I will say that there are but few manufacturers of teeth who do not heat their porcelain too rapidly. Many of the teeth are full of blisters. They throw the teeth into a hot furnace and this crust is formed on the surface, preventing the gas from escaping. I do not care whether it is carbon dioxide or what it is, but there is a gas liberated which causes the porcelain to be filled with little blisters.

I am very glad to be with you tonight. I believe the dentists of Chicago and Indianapolis are more closely in touch than the dentists of any other two cities in the United States. I assure you it is a great pleasure to present this paper here because I believe there are more good porcelain workers in Chicago than anywhere else in the United States.

On motion of Dr. Cook a vote of thanks was extended to Dr. Byram for his presentation of the paper.

THE MINNESOTA STATE DENTAL ASSOCIATION, MINNEAPOLIS, JUNE, 1905.

DISCUSSION OF THE PRESIDENT'S ADDRESS.

Dr. J. F. McCrea:

In discussing this paper the president's strongest point is his analysis of Art. 1, Sec. 2, of our constitution. There is enough food for thought in that article alone to last us for a whole year, considering the present condition of our digestive organs. We hurry on so rapidly in these times from one good thing to another that we barely get one thought until another is crowding it out. That section of Article 1 could profitably be read annually before this association as a Golden Text. (Art. 1, Sec. 2.—Its objects shall be to contribute to the elevation of the dental profession by encouraging a full and liberal interchange of opinions in methods of practice and the literary discussion of subjects relating to dentistry; to advance the standard of dental education; to promote the usefulness, honor and interests of its members; to enlighten and direct public opinion in regard to the duties, responsibilities and requirements of the dental profession, and the maintenance of a high order of professional excellence among its members.)

We will have to admit that the association in the past has not held out sufficient inducements to get a larger membership, but in the last two or three years I think that things are changing. That we are beginning to see the possibilities of this State organization and are getting better attendance and with that will come greater membership. The president's idea of making our meetings a post graduate course is an excellent one and as the association broadens its scope that fact becomes more thoroughly impressed on non-members. That idea of becoming associated with dental organizations should originate, and continue to be instilled into the mind of the student, during his dental school life. In that way the numbers of the non-ethical would be reduced to a minimum. The "enlightening and directing of public opinion," while missionary in nature, is especially valuable, from the legal phase, as was demonstrated last winter. It seems that our dental law is in constant danger unless we are always on the alert. This we can best fortify ourselves against by having greater strength numerically.

In conclusion I would say the president's paper was an excellent one, and timely, deserving considerable reflection by a much larger audience than we have here.

Dr. J. W. Penberthy:

Just a word to add emphasis to what the president has said. I feel he has touched upon many good points and can only hope his suggestions may bear fruit. The advancement of our educational standard is an objective point to which we as dentists should be a unit. There is no other step we can take that will elevate and carry our calling to such heights as the better education of the army that is invading our ranks today, nothing that would so thoroughly eradicate the non-ethical from our field and place us shoulder to shoulder with the medical side of our calling. The systematic endeavor to increase our membership should appeal to each member, and no opportunity allowed to pass to extend an invitation to those who have not joined us. The exchange of ideas must follow the coming together of any body, and only those who avail themselves of the opportunity at such times as these can appreciate what he or she has gained by the effort to be on hand early and remain late.

The coming together at such meetings as these has a very great influence in the education of the public. I am glad the president spoke of the necessity of local organizations and can only hope a movement in that direction will be made very soon throughout the State, as has already been suggested.

THE DENTAL REVIEW.

Devoted to the Advancement of Dental Science.

PUBLISHED MONTHLY.

EDITOR: C. N. JOHNSON, M. A., L. D. S., D. D. S.

Subscription price $1.00 a year including postage, to all parts of the United States and its possessions, Cuba, Canada and Mexico. All other countries $1.75 a year.

EDITORIAL.

CONCENTRATION.

If there is any one thing the members of the dental profession need it is concentration. Superficiality of thought, of observation, of effort is the great drawback to the best advancement. The habit of thinking logically, and observing closely should be cultivated early in a man's professional career.

The evidence of careless thinking is before us every day in our work. How many artificial crowns have been placed on teeth that should have been filled! It is appalling when we see so much of it, and yet it can not all be due to dishonesty. Some of it must be attributed to superficial observation, and a failure to recognize cause and effect. If all the unnecessary crowning could be traced to dishonesty it would well-nigh sink the profession into disaster and disgrace.

Men do not concentrate their energies toward the development of good judgment. Lack of concentration leads to faulty ideas and wrong conceptions, as well as to slip-shod methods in the technique of our work. To do the best for his patient a dentist must get into the very soul of his work.

How often the wrong tooth has been drilled into in locating the cause of an abscess! Not that it is always easy to locate such a cause, but that frequently mistakes of this kind are made through superficiality of thought. When a man so loses himself in intensity of application in the insertion of a filling or inlay that he becomes oblivious of his surroundings and is absorbed wholly by the procedure in hand, there is little likelihood of faulty work. Nothing pays like concentration, nothing is so fatal as a lack of it.

THE EDITOR'S DESK.

MY SUMMER VACATION.

[Continued from February Dental Review.]

AN INDIAN SWEAT HOUSE.

One morning I was walking over the ranch with my Uncle when down by the creek I saw a queer structure and asked what it was. "That is an Indian sweat house," he said, and I took a snap shot of it. The sweat house is quite an institution among the Indians. It is built by sticking arched limbs in the ground about three or four feet high, and over this framework is thrown a tent cloth, leaving one end open. In one corner of the tent or coop, a hollow place is dug in the ground with some stones in it. When an Indian is physically ailing in any way he builds a fire outside, heats the stones quite hot and piles them in the hole in the tent. He then throws water on the heated stones crawls in the tent and closes

"Indian Sweat House."

the open end. After becoming thoroughly steamed and while still dripping with perspiration he rushes out of the tent and plunges in the river. He claims to be recuperated and invigorated after this, and it is practically his cure-all. It is a primitive sort of Turkish bath, always convenient and costing much less than a dollar per bath.

FISHING FOR SALMON.

It is impossible, for lack of space, to recount all the mountain rides we took on horseback, but there was one that must not be overlooked. Fairview is situated about three miles from the Fraser River, and the report came that the salmon were running quite plentifully. The Indian Girl and I were anxious to see some salmon caught so one evening Uncle saddled the horses and we three set out. By this time Ginger and I had become such fast friends that I could think of riding no other horse, even though on account of his stiffness I was unable to keep pace with Uncle and the Indian Girl, who were soon racing horses across the range. If that girl had remained much longer in British Columbia I am afraid she would have had some of those horses climbing trees. The evening was beautifully clear and as we rode toward the river we had a magnificent view of the mountains in the distance—one of them sixty miles away. The Chilcoten country west of the Fraser spread out before us in a series of ranges that looked imposing and grand, and as the sun colored the sky beyond the distant peaks the scene was indescribably beautiful. My Indian Girl and I almost forgot where we were, it was so different from anything we had seen even in Yellowstone. We had nearly forgotten we were on horseback till suddenly we were jarred into consciousness by finding ourselves on the tip top rump of a mountain down whose narrow backbone we had to ride to get to the river far below. I was never on such a dizzy height before. The trail was only a few feet wide and on either side it dropped off into a chasm so abrupt and so deep that it made the heart quake to look at it. The trail itself descended steep as a toboggan slide, and altogether it was the scariest corner I was ever placed in.

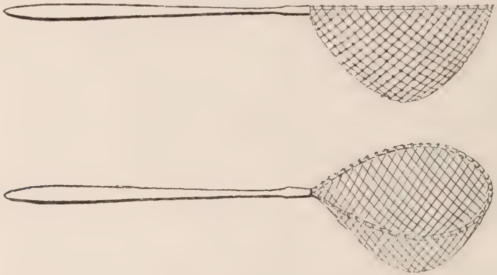
I suppose I ought to announce that I am human enough not to like to be called a coward, but when we came to the brow of that plunge I couldn't repress the exclamation, "Say Uncle John, we don't have to go down THAT, do we?" He only laughed and said it was perfectly safe and led the way with his horse. I suddenly discovered something. I had been told before that Ginger had a weak back from years of service in dragging cattle with the horn of his saddle, but I never before realized what a weak back meant in a saddle horse going down a steep place. On account of his stiffness and to ease that back of his Ginger turned and began to shuffle sideways down the trail scattering the gravel and dirt ahead of him. I might have been able to stand the ordeal if Ginger had gone right side up and I had been allowed to turn around on him and face his tail and hang on to his flanks, but when he began to skate sideways, and stifflegged at that, I patted him patronizingly on the shoulder

Ginger, my favorite saddle horse at the ranch.

and said "Whoa." It was at that instant that a very brilliant quotation came to mind: "Discretion is the better part of getting down hill without a broken neck," and so I slid from Ginger's back and led him down. When Uncle John saw me leading the horse I had to square myself in some way and so I sang out cheerily, "My splints got to hurting me so badly that I thought I would rest myself by walking a bit," and I never felt greater justification in telling a lie in my life. I was pretty well knee-sprung when I reached the bottom but my heart was nearer in the correct locality than it would have been if I had attempted to remain on Ginger. I am a trifle ashamed in one way and vastly proud in another to announce that my Indian Girl rode her horse down without a tremor, and many times on this vacation trip I fancied I detected something of the same spirit which carried her safely out of that seething cauldron the fatal afternoon at the Iroquois theater.

Ginger put me swiftly to the bad on one other occasion out in the mountains, but that was because I didn't know so much about mountain climbing as he did. We were riding along an old trail on a sharp ridge with one embankment sheer down when we found that a washout had cut the ridge and we had to turn back. Turning back wasn't a part of my program of calculations and I couldn't for the life of me see how we could do it. The path where Ginger stood was at the sheer edge of the embankment, and there was not a spare inch of room on that side. The other side was not quite so steep and I finally concluded that I must round him down on this a bit and come up on the trail as best I could. I gave him the word but evidently the footing didn't suit him or else he remembered that weak back of his and instead of going forward he suddenly swung around like a pivot on his hind feet and—shades of the bottomless pit!—his tail hung right out over that precipice! I was instantly wondering about my life insurance. I don't think I ever got such a fright in all my life, and I am not coveting another one. But the old rascal knew what he was about and instead of tipping back over the embankment as I was positive he must, he was soon jogging leisurely over the trail again entirely oblivious of the fact that he had just frightened a poor tenderfoot city chap almost into spasms.

When we got down to the river we found a good many Indian camps. The Indians flock to the Fraser at this time of year to catch and dry salmon for winter use, and the racks of salmon suspended on poles among the rocks by the bank look in the distance like pieces of red flannel hung out in the sun. And now we saw one of the most unique methods of catching fish that ever entered the head of man. It is a dip net that is used with the handle about five feet long and the net about three feet by eighteen inches wide. The fisherman stands on a rock by the river bank or on a platform built for the purpose, and simply dips the net into the water with a sweeping motion along the current. It would seem like the veriest folly to attempt to catch fish in this way, going it blindly, but there is after all much philosophy in the method as the results prove. The fish always run up against the stream and in order to avoid the swift current of mid river they hug the bank. They are thus easily picked up in the net, particularly by one who knows their habit of running. This evening Uncle John tried his hand with the net for some time without success, and finally handed it to Billy, the Indian. Billy dipped a few times and up came a salmon, then another and another. It seemed miraculous. Every time a salmon was caught Billy would give the net a flip and the fish was tossed high and dry into a receptacle built by laying stones in a circle among the rocks on shore. The fish had now begun to run in earnest, which usually takes place about sundown, and Uncle John tried the second time with better success. It was a revelation to see those fine big plump salmon picked out of the water in that manner. Just as it was getting dusk the Indian women and children began to flock down from the camps and sit among the rocks by the river and watch the fishing. Several of the young girls lighted pipes and smoked, which made them look quite sociable. Finally Billy handed the net to me to try, and I soon had a beauty



"An Indian Dip-Net."

in the toils. But oh, the awkwardness of the novice—I couldn't toss that fish out in the artistic way the others did, and it took three or four attempts before I had him safely in the rocks. Billy smiled and said, "No catch 'im now for half hour. Salmon smell net,"

"Salmon from the Fraser River."

which is a superstition prevalent among the Indians. And it really seemed for a few minutes as if Billy's prediction would come true, for we dipped and dipped without result. But safely within the half hour the fish began to come again as cheerily as ever, and it kept the little Indian boy busy with a club killing the salmon as they were tossed out. When we had seen all the sport we wanted, Uncle said to me, "Now you catch one for us to take home," which I did, and that salmon was my propitiatory offering to the Mater that night for keeping her up so very late.

As we started from the river the moon shone like a silver ball over the landscape, and I shall never forget the magnificence of that mountain climb. Ginger had my entire confidence by this time, as I had begun to learn that he was wiser and safer than I about scaling peaks, and I gave myself over to the full enjoyment of the occasion. Sometimes as we were riding along a high ridge our three figures would be sharply silhouetted against the opposite bank as if other horsemen were skirting the mountain side. Once to add variety the moon went under a cloud, but the nights of British Columbia are wonderfully light and the horses knew every twist of the trail. It was about 11 o'clock when we reached home, with one more novel experience to dream over.

(*To be continued.*)

DOMESTIC CORRESPONDENCE.

NEW YORK LETTER.

The Odontological Society had the honor of entertaining Dr. J. E. Hinkins, of Chicago, on January 16th, in the banquet hall of Burn's restaurant.

Dr. E. C. Kirk, of Philadelphia, Dr. L. F. Acree, of Baltimore, and Dr. G. W. Cook, of Chicago, were also guests of the society. Dr. F. T. Van Woert officiated.

The meeting of the evening was held at the Academy of Medicine, and the essayist, Dr. J. E. Hinkins. His subject was "Some Investigations on General and Local Erosions of the Teeth."

The session was terrifically long—almost three hours—but one full of interest from start to finish.

Dr. Hinkins seemed to be accepting the challenge of another gladiator in the arena of science. He did not go about it in a half-hearted way, but plunged into combat by assuming the aggressive, insisting on a contest to the finish. His antagonist rose to the occasion, defending himself so well that he made, of what might have been an inglorious surrender, a graceful "draw."

Dr. Hinkins' paper severely criticised and catechized Dr. Kirk for alleged misstatements of facts and of so-called quotations from his paper, and of trying to take credit from him for his researches, showing the role of the organic acids formed by mouth bacteria, and giving the credit to Dr. Miller. "Would it not seem very strange that Dr. Miller should forget to credit himself in his own book." "Miller actually refers to about fifteen individuals before his time who held the chemical theory as the correct one." "He does not at any time take credit for this hypothesis." Miller says—quoting authorities—"that erosion is most frequent when the saliva has an alkaline reaction."

Dr. Hinkins then proceeded to point out in Dr. Kirk's paper where he has misstated and misquoted or distorted paragraphs therefrom (Dr. Hinkins' paper). "Dr. Kirk's authority for the above statements originated with himself." "Dr. Kirk's paragraph is then a fabrication."

Dr. Hinkins went on to show wherein Dr. Kirk's methods of analysis were at fault as to the presence of lactic acid in the saliva of his patient, by means of his so-called calcium lacto-phosphate. He objected to the methods used as not being at all conclusive. "Since we have nearly 100,000 organic and inorganic chemical compounds tabulated, and since there are comparatively few crystal forms known, it follows as a necessary consequence that there must be many hundred compounds having the same crystal form and the power to rotate polarized light when in the crystal state."

Further on in his paper Dr. Hinkins took up the study of Dr. Kirk's so-called calcium lacto-phosphate, trying to determine any connection between it and general erosion as claimed by Dr. Kirk. In summarizing this part of his paper Dr. Hinkins said that "Dr. Kirk made two guesses, but not once did he analyze the compound to see if his first guess or his second guess was correct." "The first time he guessed calcium lacto-phosphate, the second time he guessed the only other guess left—not calcium lacto-phosphate."

Dr. Hinkins pointed out that when calcium phosphate is dissolved in formic, acetic, hydrochloric or propionic acid and allowed to crystallize from these, sheaf-like crystals very similar to those of calcium acid lactate are obtained which show the same optical properties. "So it is evident that cases of erosion by these acids (all of which might be formed by fermentation and could dissolve the tooth substance) can not be differentiated from Dr. Kirk's case of lactic acid erosion by the sheaf-like crystals."

Dr. Hinkins monopolized much time in his paper (about an hour) as beyond a doubt he did in the laboratory, with the "study of calcium acid lactate—Dr. Kirk's so-called calcium lacto-phosphate." He said that "from the beginning he was in doubt that it was really a lacto-phosphate." He and his collaborators treated the compound in many ways in determining grounds for their deductions.

At the close of the reading the meeting room was darkened and Dr. Hinkins showed on the screen a number of slides of different chemical compounds the crystal formations of which were similar, so much alike that it would seem one could readily mistake them if depending upon microscopic examination only. Polariscopically there might be some difference but, of course, that did not show up in the photographs.

Dr. Kirk was on hand to defend himself. His answer to Dr. Hinkins was written and consumed much more time in the delivery than did the essayist's paper (more than one hour and a quarter). Strange to relate, with but few exceptions, the audience retained interest in the proceedings throughout. And then, too, it had been announced that there would be other things to chew after the exhibition.

It soon became apparent that it was a test of strength, a battle royal was in progress and there were a goodly number of spectators.

Dr. Kirk separated Dr. Hinkins' paper into phases of difference.

The first, phases of differences or grievances.

The second, the subject of the paper.

"If, in the first phase, I have robbed him of any credit it was done unintentionally." "Who has shed the light is of secondary importance." "I would be as pleased to hail him as 'discoverer' as any one else."

Dr. Kirk then went into quotations from Dr. Miller's works and from Dr. Hinkins' drawing parallels to show that some of the contentions were generally accepted beliefs.

He said he felt that the "difference" is really between Miller and Hinkins and not between Hinkins and Kirk.

"With all the claims of Dr. Hinkins I can not see that he has solved the problem of etiology of erosion."

In taking up the second phase Dr. Kirk said he had been taken to task for lack of properly determining the chemical composition of saliva.

He quoted further from Dr. Hinkins and then said: "Of all the hard things in chemistry it is the analysis of saliva. It is changed by diet, the habits of the individual, etc., etc., and is, in fact, almost impossible." "In view of this fact how could it be expected that I make an analysis and if so I do not think Dr. Hinkins would have accepted it."

In conclusion Dr. Kirk expressed the desire to enter a disclaimer as to calcium lacto-phosphate being referred to as Kirk's.

All in all Dr. Kirk made quite a good showing. It was generally conceded, and developments showed that even Dr. Hinkins was surprised to see how well Dr. Kirk "pulled out."

His disclaimer of any intention of malice or disparagement and his admission of difficulties and intricacies to be surmounted in following scientific research made his position tenable. His language, though not submissive, indicated his desire to record things aright and to "play fair" as gentlemen should, even though moods sometimes picture one as caustic.

Dr. Acree, of Johns-Hopkins College, Baltimore, was next called upon to contribute to the discussion. His talk was bright and intelligent, indicating more ready familiarity with that extremely difficult science, chemistry, than ordinary. He said that he had heard there was a "difference." He felt that the paper had deviated from its title. Chemical erosion was not necessarily due to bacterial action. It was his opinion that it takes two or three days to produce chemical erosion in the laboratory by concentrated acidity. The chemical reaction of bacterial enzymes in the body are producing acids in the body which produce these changes.

He does not believe erosion is due to any one acid. It has been seen that excessive alkaline saliva will erode.

Dr. Cook, of Chicago, opened his talk with a witticism on the furniture which "took" (he had pushed the bottom from one of the heavy upholstered chairs on the platform). He interspersed his remarks with so much timely wit it kept the listeners in good humor. He said that he expected Dr. Kirk would pull things apart, but "he isn't such a bad fellow after all." Speaking to the etiology of erosion, he said in his inimical way, none of them have decided just what it is, but the last man—referring to Dr. Acree—cornered it in a gland.

Then he told how he (Dr. Cook) had been following the subject from a different quarter, by electric conductivity of saliva and by the production of colloidal action, a method of his own and one not completed, but the field of research promised to disclose something interesting. He, too, has produced artificial erosion on teeth by acid means.

In conclusion he referred again to Dr. Kirk by saying, "if that gentleman had confined himself to arguing the question rather than to criticising unjustly we (he, Dr. Hinkins and others) would not have felt so bad about it."

Before Dr. Cook took his seat he rounded the edges of the "difference" so well that the event was assuming the proportions of a love feast, and when it came time for Dr. Hinkins to close the debate, he said: "Had I heard Dr. Kirk's discussion first I would never have written the paper. His (Dr. Kirk's) was a very much better discussion than I expected to receive. I did feel slighted by his not giving me credit because I gave my deductions as I saw them. I feel better toward Dr. Kirk now and think that he is a better man!" The society voted hearty thanks to the essayist and discussionists.

Dr. Kirk asked the privilege to thank the society for furnishing the arena.

At adjournment Dr. Hinkins and Dr. Kirk shook hands heartily and the controversy was ended.

The great door to the banquet room was raised, disclosing the collation which the society had prepared for the occasion.

The New York Institute of Stomatology held its regular February meeting on the sixth, this time having a clinic and two brief papers in the afternoon, in addition to the regular essay and evening meeting.

The clinic occurred at the office of Drs. E. A. and F. L. Bogue, 63 West Forty-eighth street, at 4 o'clock.

Dr. L. M. Cowardin, of Richmond, Va., exhibited an appliance designed to extrude the apices of the upper incisors and at the same time extrude the upper molars and bicuspids, thus opening the bite. He presented models with the appliance showing case when first presented, lower incisors impinging upon the gums behind upper incisors, and models of the work as progressing.

He also presented what seems to us even more important, an appliance for correcting *cross-bite,* or unilateral prognathism, *without* causing a disturbance of the normal articulation on the opposite side of the arch. With this he had several models showing the progress of the work.

Following him Dr. Karl Chapin Smith, of New York, read a brief paper on the "Construction of Porcelain Contours for Incisors, Using a section of porcelain tooth in combination with high or medium fusing bodies." His main point was that by fitting a piece of porcelain tooth a better color would be obtained and the sharp corners and angles necessary to such restoration maintained. The use of body to attach this porcelain tip to a *platina* matrix was described in detail. Enough body is first fused in matrix to nearly flush it with edges and then the tip is attached with a *small* quantity of hard wax, withdrawn from cavity, body tamped in about this piece and fused, the small quantity of wax melting out without detriment to the work or color.

There were a number of orthodontists present—Drs. Bogue, Jackson, Stanley, Young and Stanton—and nearly every one of the forty members present is a porcelain worker, so the clinic was voted a decided success.

The afternoon session lasted until the dinner hour, when those assembled adjourned to the "Chelsea," where dinner was served. Shortly after 8 o'clock the president, Dr. Davenport, introduced Dr. Louis Jack, of Philadelphia, who discoursed on the "Conservative Treatment of the Dental Pulp."

The particularly interesting feature of his paper was the temperature range of tolerance of normal and abnormal tooth conditions.

He keeps a carefully tabulated record of range of tolerance of affected teeth. That is, of those conditions of impaired pulps, not necessarily cases of gingival recession which are always more or less sensitive to change of temperature. He found the range of tolerance to be between 155 degrees as maximum and 41 the minimum. Those of pulpal infection between 112 and 76. The average normal range was between 130 and 55 degrees. He claimed that neuralgia often occasioned the removal of fillings that could be averted by thermal tests properly recorded. The ascertainment of heat tolerance of a tooth he believes is as necessary as blood test.

His method is quite simple, consisting of two pitchers of water, one hot the other iced, a clinical thermometer and a quick filling bulb syringe. He uses the Woodward. Teeth, the pulps of which have been aching or suppurating, he does not attempt to conserve, but there are many other pulps in which it is wise to reduce the inflammation and save.

Where hyperemia exists he uses a metal cap (aluminum) and carries on this to the seat of distress a thin paste made of eugenol and zinc oxide. The efficiency of eugenol depends upon its analgesic action. A trifle of oil of cloves which will not irritate the pulp and will add to the antiseptic value of the dressing, may be used. Two parts oil of cloves and one part carbolic acid is good treatment to quiet and assist devitalizing pulps when that process has begun.

An interesting phenomenon was noted to the effect that after capping some pulps the heat and cold range both rise, but after a short time it becomes normal. Some of these cases may require after treatment, particularly if they respond too readily to cold. To two parts of aconite one of chloroform is added. The gum over outside of the roots of tooth is dried and a pellet of cotton from which excess of the remedy has been absorbed is held to the gum for twenty seconds. If a second application is necessary it is made the following day, this time on the inside. He finds success in saving pulps, other things being equal, is in proportion to the interest cf the patient.

Dr. Jack disagreed with Dr. Black's theories when he said that the strength and color of teeth are impaired by devitalization of pulps.

Dr. H. W. Gillett discussed the subject to some length. He was loath to criticise the efforts of such an able man as Dr. Jack, feeling it presumption, but practice differs. He asked the question: "Does the pulp in time become of neglible value to the economy?"

Dr. Gillett affirmed that the patient who had little wrong with a recently treated tooth (fussy patient) is soon cured by the application of aconite and chloroform. If aconite is the chief remedy why not prescribe it internally? Small and frequent doses would seem the simpler way. Dr. Jack in his paper spoke of using arsenic for devitalizing those pulps not amenable to treatment. Dr. Gillett in referring to this said he had not used the drug once in five years. He feels that if he applied it to any of the eight anterior teeth he would be doing his patient an injustice. His choice is for cocaine (pressure anesthesia) every time. There need be less fear of color or strength impairment by resorting to the surgical removal of the pulp in doubtful cases.

Dr. George L. Allen interprets the modern western idea of extension for prevention as destructive dentistry. "Even Dr. Black has said that if all discoloration of dentine can not be entirely removed, to uncover the pulp and devitalize it. That to me is wrong." The preservation of all living tissue should be of first importance. We all know from clinical experience that it is not necessary to remove all discoloration, especially when the uncovering of the pulp might be the result. Where should we draw the line as to age of tooth or patient in devitalizing?

Dr. Howe commended the essayist for giving us a system whereby we may better treat these cases, determining the pathological extent.

Eugenol and zinc oxide is a very valuable remedy. It can be used to temporarily fill a cavity that can not be kept dry, and makes quite a lasting filling.

Dr. E. Howard Babcock spoke of the scientific control of heat being very valuable. We have been using it in a crude way. In the treatment of deciduous teeth it would probably not be so valuable. As to the treatment of pulps: In young people we can not be too careful. In middle life the chances are about even, but later in life we can afford to take longer chances. His policy has been that when a tooth responds to cold it is not wise to lose time but "step inside and clean house." The old remedy, aconite and iodine, to Dr. Babcock seemed as efficacious as any owing to its action on the arterial supply and lymphatics.

In his summary Dr. Jack conceded that as age advances the pulp becomes increasingly less valuable. It has retired from the seat of operations, in many instances disappears altogether. Fearing there may be some misconception about his using arsenic, he assured the audience that he rarely resorts to it.

The annual meeting of the "Technique Society" was held at the Chelsea in West Twenty-third street, and proceeded as usual with the regular dinner of the hotel served to the society in a private room. Preceding the business meeting the members gathered around a long table and listened to a short paper by Dr. F. L. Stanton on "Duplication of Plaster Models," after which he demonstrated the method, pouring several models in one impression or *from* one impression. It is characteristic of this society that it does not want essayists who are not willing to demonstrate, and as its name implies, give actual demonstration of the "technique" of their work. In other words, a la Missouri, "show me." So. Dr. Stanton presented a wooden frame or box with a gelatine mold in it, made from a model, described his method of making the mold and then poured some models therein.

After the brief discussion reports of various committees were had, and election took place, resulting as follows: President, Dr. C. M. Hoblitzell; vice-president, Dr. F. L. Stanton; secretary and treasurer, Dr. E. D. Reed.

In the early part of the meeting the president presented some radiographs of a very interesting case of abscess on an upper central incisor. These had been taken by Dr. Sinclair Tousey for Dr. Henry W. Gillett and were sent the society by Dr. Tousey, as he was unable to be present. The case as reported had been a very obscure one, but the radiographs showed *clearly* an extensive area of disintegration and pus formation.

The report or address of the retiring president, Dr. Frederick Crosby Brush, was well worth listening to. It was a comprehensive review of the year's work and of the struggles of this youthful organization.

The January meeting of the Central Dental Association of Northern New Jersey at Newark, N. J., was addressed by Dr. Ellison Hillyer, a young and prominent dentist of Brooklyn, on "Twentieth Century Dental Methods—Ideals and Ethics." Knowing that this meeting marked the end of the C. D. A. society year and standing as it were on the verge of an incoming year, he thought it well to look back for a few moments and consider "where we are at" in the dental profession today. Referring to all the present day fads and interests—"arsenic," "non-cohesive gold," "amalgam," "porcelain and gold inlays," "pulp anesthesia," "x-ray exploitation," "orthodontia" and "sterilization"—he said it would require about ten evenings' attendance *per month* on dental society meetings to "keep up with the procession and much more than that amount of time given thoughtful perusal of our literature. The twentieth century dental position demands that we be *thoroughly progressive, yet studiously conservative.*"

He thought we should be thankful there were some called "over enthusiastic" to spur the laggards on to something approaching a standard of excellence. Referring to the rational operator's selection of good and discarding bad, the general conservatism of the times regarding display of gold, the care in sterilization of instruments, etc., he asked, "What has brought this about?" After answering that as he thought best he asked the further pertinent question—"Are we individually living up to these highest ideals?"—finishing that portion with "let us be as honest as we can with ourselves and our patients."

While approving of all means of asepsis and cleanliness in and around the operating room, he inveighed against the inordinate display of hospital fittings, etc. He also spoke at length of one's personality, which certainly is a matter of vital importance.

He claimed that *true* professional ethics might be summed up in President Roosevelt's famous phrase—"give every man a square deal." He would prefer to take off his hat to an "ethical advertiser" rather than to an "unethical ethical practitioner," saying there are many of the latter class. He thought we should try to help every man raise his standard, and at the beginning of this twentieth century be liberal, high minded, individually and collectively.

Dr. Hillyer's paper was one of those which can excite nothing but commendation. Dr. Luckey said of it: "It is a long time since I have listened to such a clean cut, concise, brilliant paper. The subject is not new to us, but contains a truth necessary to be brought before us often. It is Utopian to expect ethicism."

Dr. Bradfield said the greatest hit of the paper was at the unethical ethical practitioner.

The question of ethics in relation to the younger men was a very serious one in Dr. Fowler's mind. The young man must make his new office pay and just how to do it and remain ethical is many times a very serious proposition. Dr. Fowler had been called upon to speak for the younger men.

Dr. Sutphen said that he had always kept thinking of ethics. There is very little excuse for a man violating a code. We all know what is and what is not ethical.

There had been some talk by Dr. Luckey of flaunting of titles, particularly by those higher up in the profession, which he interpreted as unethical.

Dr. Pruden asked the question, "What are we to do with our degrees?"

Even the display in the office of dental pictures and paraphernalia was touched upon as obtrusive. . Dr. Richards said that in his office everything is out of sight except his chair, bracket and cabinet.

Dr. Hane considered the question of ethics a purely moral one. He does not see why a man may not use all titles where and when titles can consistently be used. All writers on technical subjects use their titles, on title page.

Dr. Adams considers the real ethical man the one who does for himself and family, his fellow man and his patient. He must have in view continually his person.

Dr. Meeker commended Dr. Hillyer's paper. "He has taken an essay and outlined the history of a life time. Every man has a fad. Mine is local societies. In the state of New Jersey there are probably 900 dentists. There are six local societies. They are missionaries."

Dr. Meeker is right. Dental societies do more to teach the young man the "golden rule" than any other factor. From my observation in proportion to the number of men in practice, there are fewer unethical practitioners in New Jersey than in any other given territory.

There was no adverse criticism, which Dr. Hillyer said he expected. He did not believe that the robes certain faculties don upon occasion, the appending of titles to the names on programs, and the reprints were put on ostentatiously. The early career of the younger man is a serious proposition. Every man has to meet that "wolf," has got to make his way.

He was induced to write the paper because there was so much said as to who should and who should not be admitted as members of our societies. The point least touched both in paper and discussion was the man who shrugs his shoulders when asked about his fellow practitioner or neighbor.

"The final sweetness will be, not how much money we have but how much hold we have on those we have come in contact with."

The February meeting of the Second District Dental Society was held on the evening of Lincoln's birthday, the 12th inst., at the Kings County Medical Society's library rooms on Bedford avenue, near Atlantic avenue, Brooklyn.

The president, Dr. Horace P. Gould, occupied the chair. This is his second term of service. We thought he had been remarkably successful in the past year, but evidently he hopes to "out-Herod Herod" if possible, this year.

Prof. Edward C. Kirk, of Philadelphia, was the essayist, his subject being "The Question of Tartar Formation." His paper was perhaps more in the nature of an inquiry based on certain facts which he had proven and a request that those present should aid him in the prosecution of his researches by noting in certain given cases where there was an excessive deposit of calcareous material the food habit of the patient, especially. He thought, as a result of his investigation that the tartar question was a phenomenon of abnormal nutrition, and probably an indication of malnutrition. Said that he had strong grounds for believing that excessive deposits of tartar indicated malnutrition and by reason of this he desired the assistance of those in active practice who would observe the food habit of their patients and send him specimens of their *morning* saliva and urine.

As per the program the discussion was opened by Dr. Charles Otis Kimball of New York. He said he had come to learn at the feet of Dr. Kirk. Thanked Dr. Kirk for the clearness and accuracy of his deductions, agreed that our health is really at the base of the formation of tartar. Referring to what Dr. Kirk had said of the production of carbonic acid in the human system, he said it was storing up that which would produce tartar. He thought it was the regular or usual condition of the human being to have considerable tartar upon the teeth. He said it was very wise to take the clinical history in each case and note the bearing of health to the deposit.

Dr. R. Ottolengui, of New York, spoke of pyorrhea as having been said to be a local trouble; if salivary calculus is an expression of constitutional tendency the future of prophylaxis must depend on a much broader knowledge of the cause. A scientific paper is usually considered a dry paper. Later referring to mouth breathing which had come into the discussion, he said that it was not necessary to open the mouth wide, in order to perform mouth breathing.

Dr. William Jarvie, of Brooklyn, thought the most important idea of the evening was the fact brought out that the deposit of tartar on patients' teeth might be evidence of physical condition.

Dr. J. G. Palmer, of New Pork, referred to the fact that our patients so frequently ask this question: "Doctor, why do I have so much tartar; where does it come from?"

Dr. H. Clay Ferris, of Brooklyn, thanked Dr. Kirk, not merely for this evening's work, but for former work on the same lines. Said that in some cases when physicians had found no trace of uric acid in examinations of blood and urine for some of his patients he had been able by following Dr. Kirk's suggestions and experiments on saliva to obtain help and successfully treat his patients systematically.

Dr. Barker, of Brooklyn, asked the question as to the effect of carbonic acid from the lungs coming in contact with the saliva. Referred to mouth breathers in this connection.

Dr. Young, of New York, inclined to the belief that lack of use of the teeth by reason of mal-occlusion had more to do with the condition than systemic disturbance. Does not believe that mouth breathing is a habit but a compulsion by reason of condition in the nares.

THE BURROUGHS.

PRACTICAL HINTS DEPARTMENT.

EDITED BY G. W. JOHNSON, D. D. S.

[This department is for busy readers. We want short articles containing practical ideas—the shorter the better. No article must exceed 200 words, unless of exceptional merit. Every dentist has some useful hint that has been of value to him, and if he will only put it in print it may be of equal value to others. That is what this department is for. Due credit will be given for every article sent. Address G. W. Johnson, THE DENTAL REVIEW, 55 State street, Chicago, Ill.]

Worn Mandrels:—If a mandrel becomes so rusted or worn that the screw no longer holds, a light blow with a hammer will flatten the hole slightly and cause the threads to hold as good as ever.—*A. C. Willman, Kankakee, Ill.*

To Polish Rubber Plates:—In giving the final polish to rubber plates, I find that a polishing wheel made of about twenty-five thicknesses of unbleached muslin gives a better finish than chamois skin or a soft brush wheel. The edges of the circles of cloth become frayed and do not scratch.—*A. C. Willman, Kankakee, Ill.*

To Prepare Aluminum Plates for Rubber:—Do not spur them. The only way to successfully attach rubber to aluminum is by use of the loop punch sold by all dealers. Make one row near the margin, four loops on each side, and one row of eight on the ridge. Punch the loops after the case is ready for packing the rubber, for then it will not be necessary to fill the palatal openings with wax.—*L. P. Haskell, Chicago.*

To Set An Inlay:—An hydraulic cement should be used, as it conduces much to the comfort of both patient and operator, the saliva being permitted to reach the case within two or three minutes, thus obviating the necessity of covering with varnish, etc. The excess cement should be permitted to remain until quite hard, when it can be removed, and the operation finished.—*George T. Banzet, Chicago.*

Burnishing Matrices for Inlays:—I wish to abolish the *bete-noire* of beginners of inlay work. That is, the fear of getting folds in the matrix at the margins. It is of absolutely no consequence, as, if the margins be properly prepared, the folds can be burnished down to the same gauge as the remainder of the matrix. The important consideration is the adaptation of the matrix to the walls and grooves of the cavity, and the avoidance of tearing it, and this can be more surely accomplished if the folds at the margins be disregarded.—*George T. Banzet, Chicago.*

To Remove Coating from Instruments After Boiling:—The coating which sometimes forms on instruments when boiling may be removed with the following solution:

Prepared chalk	2 oz.
Add ammonia	2 oz.
Alcohol	2 oz.
Water	4 oz.

Rub the instruments with a cloth saturated with the solution. Then wipe them with a dry cloth.—*J. Q. Byram, Indianapolis, Ind.*

Diagnosing Fracture of the Inferior Maxillary Bone:—Most fractures occur in the body of the bone in the region of the mental foramen, and less frequently as we proceed in either direction from this foramen, being rare at the symphysis. In addition to the symptoms present in fractures of other bones, there will generally be one or more loose teeth at the line of fracture and the patient will complain of inability to properly close the mouth or to masticate food. It frequently happens that the patient comes for treatment or removal of the loose teeth without knowing that the bone has been fractured.—*Arthur D. Black, Chicago.*

Acid Treatment for Pyorrhea Alveolaris:—The most successful method I have used in the treatment of pyorrhea alveolaris has been by the use of acids, and I think there is no acid more potent than the aromatic sulphuric acid, which might in some cases be increased by the addition of a little sulphuric acid of commerce. This is a weak solution, only 13½ per cent of the sulphuric acid of commerce, with a little ginger and cinnamon, but when reduced (adding to about one part of the acid three of water), and with a suitably formed syringe, carrying the preparation around the tooth, we can see the parts improve rapidly.—*Truman W. Brophy, Chicago.*

Treating Pyorrhea Cases:—The steps necessary to a cure are thorough removal of the deposits, surgical cleanliness of the parts, a fixing of the afflicted teeth to obtain rest, and some medicinal agent that will assist nature to arrest the disease and to regenerate the tissue. After the removal of the deposits, the pockets and surfaces should be thoroughly washed or flooded with warm lactic acid, full strength, or trichloracetic acid, 5 per cent. Obstinate cases may require radical treatment. In cases where the pus seems very persistent, it may be due to necrosis, and in order to provide a better drainage an opening should be made through the bottom of the pocket through the gum.—*T. A. Hardgrove, Fond du Lac, Wis.*

Fees:—Good dentistry belongs to a high order of skill and can not be acquired without preparation, integrity and perseverence. Without the aid of skilful dentistry humanity could not have health and attain longevity. We are, therefore, as practitioners of a branch of the healing art, important factors, and can not be dispensed with. In the sphere we operate we are quite as necessary as is the physician and surgeon, for it takes the combined skill of the three professions to keep the human body in a fair state of health. Our remedy then lies in the appreciation of this fact, and a fee commensurate with service rendered should be considered in every case we treat, every case we operate upon, and every denture we supply. —*W. H. Chilson, Appleton, Wis.*

Replantation or Implantation:—The more conservative operators are very wary about replanting or implanting teeth. It is seldom that you will find a case that will last longer than three years. They are very firm for several months; if you tap them with an instrument they have the metallic sound, seem to be a solid mass, like hitting a dry bone. They have not got the elastic sound or percussive touch as you find in a tooth with a live socket. Shortly after that that condition passes away and gradually the root of the tooth becomes absorbed, and about three years is the time limit usually of the great bulk of that class of teeth. I think I should hesitate to reimplant a tooth that I could not save while it had its peridental membrane still adhering to the periosteal surface in the alveolar border.— *B. G. Maercklein, Milwaukee, Wis.*

Gold Filling:—Gold unannealed, or but partially annealed, can, with proper manipulation, be brought into such close contact with the walls and edges of a cavity as to practically hermetically seal it, thereby insuring it against the further inroads of decay. To secure results approaching perfection in this particular it is the writer's idea that the cavity should be so formed as to give the operator as nearly direct access to the various cavity walls as it is possible to secure. In other words, it is extremely difficult to adapt and condense gold by working "around a corner." The same rule applies to obtaining condensation at the edges—pressure being applied as nearly as possible at right angles to the edge to be covered.—*A. J. Elmer, Bloomington, Ill.*

Dental Societies:—No doubt many of us have asked ourselves: Why should I join a dental society? If anything of value transpires I can read it in the journals. It is true that the dental journals do much toward the distribution of knowledge, and are of great value to professional progress, but it can not be said that they take the place of the societies. A man reading an article can not rise to dispute with the author; if the argument is not quite clear he can not ask for an explanation. If the dental journals be closely observed it will be noted that the great bulk of the matter comes originally from the dental societies. Progress, therefore, however much aided by the publications, is nevertheless fostered by the societies that urge men to write and discuss and prepare attractive programs to induce attendance.—*C. W. Lawrence, Bethany, Ill.*

Sterilization of Instruments:—As to the sterilization of instruments, forceps, knives, clamps, etc., I use a sterilizer made of copper. It is practical and inexpensive. All instruments which have been used are taken to the laboratory. Those smeared with blood and pus are thoroughly scrubbed with soap and a brush and are then placed in the sterilizer, which contains about a quart of water and a little carbonate of soda, to prevent the instruments from rusting. Then they are boiled for twenty minutes. This process insures perfect sterilization. Engine burs and broaches are cleaned with a rapidly revolving wire brush and then placed in pure carbolic acid, there to remain until needed. The mouth mirror is placed in pure alcohol, there to remain until needed. It can then be washed in water and dried with a napkin.—*E. M. Kapitan, Manitowoc, Wis.*

Extending Cavities Before Filling:—In preparing cavities we must study each case individually and use our best judgment as we proceed with the work. One important factor in extension for prevention is the absolute knowledge of the direction of the enamel rods and the lines of cleavage. It is important also that the operator should know the condition he is called on to treat, why it originates, how it extends and what to do to prevent it. Dr. Black tells us that when the area of liability is removed we have fully satisfied the idea of extension for prevention. It will readily be seen that the size of these areas is by no means in all cases the same. The teeth may be round in form, making the area small, while in some cases the teeth are broad or flat, making an extensive contact surface, consequently making the area of liability much greater.—*D. J. Hughes, Palestine, Illinois.*

Inlays in Posterior Teeth:—Ordinarily I make two appointments with my patient when an inlay is to be inserted. The first appointment I prepare the cavity and make the matrix; the second appointment I have the inlay ready to set. I adjust the rubber dam, and after washing out the cavity with alcohol and thoroughly drying it with *hot air* I set the inlay under pressure by wedging, if it is a proximal filling. If a crown, buccal or lingual filling I get my pressure by use of strong rubber bands, or by holding the end of a suitable instrument, or piece of wood against the inlay for about ten minutes. After trimming away the surplus cement I coat it over with a little sticky wax to keep the moisture away until the cement is thoroughly set and remove the rubber dam. The whole operation of setting should not take over fifteen minutes.—*G. C. Marlow, Lancaster, Wis.*

Heat as a Factor and an Aid in Treatment:—The pain caused by cementing gold crowns may be relieved by the application of dry heat. An excavator with a wooden handle attached to the cutting end makes a good instrument for this purpose. Heat it red hot with a blow pipe and hold the heated end firmly against the occlusal surface of the crown. Remove as soon as the patient begins to feel pain from the heat and a second application is rarely necessary. In teeth containing root fillings and giving trouble, the above instrument may be used to apply heat to aid the absorption of a medicine, in the following manner: Remove the filling from the crown, expose the floor of the pulp chamber, and after heating the instrument apply to the tooth, holding it well into the cavity. When the heat causes pain apply a pellet of cotton saturated with a volatile, astringent, antiseptic mixture, immediately sealing the cavity with temporary stopping, and repeat if necessary. While this will not cure bad cases, good results have been obtained where it was not possible to remove filling from the roots. The mixture I use is a saturated solution of tannin in alcohol, to which is added an equal quantity of creosote. The principle is that an excessively dry tooth absorbs readily.—*Oliver Martin, Ottawa, Canada.*

MEMORANDA.

THE NORTH NEBRASKA DENTAL ASSOCIATION.

The second semi-annual meeting of this society will be held at Norfolk, April 5, 1906. C. S. PARKER, *Secretary.*

AMERICAN SOCIETY OF ORTHODONTISTS.

The next meeting of the American Society of Orthodontists will be held in New York City during Christmas week, 1906.

FREDERICK S. MCKAY, *Secretary.*

DEATH OF MR. HENRY M. LEWIS.

Mr. Henry M. Lewis, president of the S. S. White Dental Manufacturing Company, died in Philadelphia January 26, 1906. A more extended notice will appear in our next issue.

STATE BOARD APPOINTMENTS.

In California Governor Pardee has appointed on the State Board of Dental Examiners Drs. Garrett Newkirk, of Pasadena and J. Loran Pease, of Oakland. Congratulations to the governor and citizens of California.

KENTUCKY STATE DENTAL ASSOCIATION.

The next annual meeting of the Kentucky State Dental Association will convene at Dawson Springs, Ky., June 4, 5 and 6, 1906. We anticipate a most pleasant as well as a profitable meeting and a cordial invitation is extended to the profession. W. M. RANDALL, *Secretary.*

JOINT MEETING.

The California State Dental Association and the Alumni Association of the Dental Department of the University of California will hold a joint session and clinic at San Francisco, Cal., May 14 to 18, inclusive, 1906.

C. E. POST, *Recording Secretary.*

MINNESOTA STATE DENTAL ASSOCIATION.

The twenty-third annual meeting of the Minnesota State Dental Association will be held in Minneapolis at the dental department of the State University on June 11, 12 and 13, 1906.

J. F. MCCREA, *President,* Minneapolis,
F. E. COBB, *Secretary,* Minneapolis.

MINNESOTA STATE BOARD OF DENTAL EXAMINERS.

The next regular meeting of the State Board of Dental Examiners will be held at Minneapolis in the dental department of the State University on April 3, 4 and 5, 1906.

All applications must be in by Tuesday noon, April 3d. Application blanks wil be furnished upon request by Dr. George S. Todd, secretary, Lake City, Minn.

THE INTERNATIONAL DENTAL JOURNAL SUSPENDS.

With the December number, 1905, *The International Dental Journal* ceases publication. This is to be greatly regretted. The journal has been a force for good in dentistry, and we are particularly sorry to lose from the ranks of dental editors so able a man as Dr. James Truman. Few men have labored more unselfishly than he for the upbuilding of the profession and his work on the *International* has always been marked by an effort to attain the highest ideals.

THE NEW COVER.

The new cover of THE DENTAL REVIEW has received the cordial commendation of our readers, and also of the dental press. The kindly notices given are greatly appreciated, particularly that of our esteemed contemporary, *The American Dental Journal,* which in its February issue pays us a graceful compliment. *The American Dental Journal* itself is to be congratulated on a new cover which is tasteful, neat, and wholly appropriate—a very great improvement over its previous cover.

INDIANA STATE DENTAL ASSOCIATION.

The forty-eighth annual meeting of the Indiana State Dental Association will be held at West Baden and French Lick Springs, Ind., June 26, 27 and 28, 1906.

The social side of this meeting will be a feature, while the papers and clinics have promise of being the best ever given at this society.

Ethical practitioners are invited to resort, recuperate and reillume with us. R. A. ADAMS, *Secretary,* Clinton, Ind.

MICHIGAN STATE BOARD OF DENTAL EXAMINERS.

At the last regular meeting of the Michigan Board of Examiners in Dentistry, held at Ann Arbor, the following officers were elected for the ensuing year: President, Walter C. McKinney, Saginaw; treasurer, Charles H. Oakman, Detroit; secretary, Albert L. LeGro, Three Rivers.

Reciprocity with Oklahoma was ratified. Michigan now interchanges licenses with Canadian Northwestern territories, New Jersey and Oklahoma.

Albert L. LeGro, *Secretary*,
Three Rivers, Mich.

ANNOUNCEMENT.

The Board of Trustees of Barnes University, of St. Louis, Mo., announces the following as the present faculty and officers of the dental department: George H. Owen, D. D. S., Dean; Otto J. Fruth, D. D. S.; S. H. Voyles, D. D. S.; C. O. Simpson, D. D. S.; W. B. Arthur, D. D. S.; T. G. Donnell, D. D. S.; W. H. Love, D. D. S.; C. P. Strawn, D. D. S. Members of the executive committee, Doctors Owen, Fruth and Voyles.

The new building of the dental department will be completed about June 1, 1906, and will be of modern appointments. John M. Wood,
President Board of Trustees of Barnes University.

INSTITUTE OF DENTAL PEDAGOGICS.

At the thirteenth annual meeting of the Institute of Dental Pedagogics, held in New York December 28, 29 and 30, 1905, the following officers were elected for the year 1906: President, D. R. Stubblefield, Nashville, Tenn.; vice-president, J. H. Kennerley, St. Louis, Mo.; executive board, Ellison Hillyer, 472 Greene avenue, Brooklyn, N. Y., L. P. Bethel, Columbus, Ohio, and J. Q. Byram, Indianapolis, Ind.; master of exhibits, H. E. Friesell, Pittsburg, Pa.; master of new teaching facilities, C. E. Jones, Chicago, Ill.

The next meeting will be held at Chicago, Ill., December 27, 28 and 29, 1906. W. Earl Willmott, *Secretary*.

NEW YORK STATE DENTAL SOCIETY.

The thirty-eighth annual meeting of the New York State Dental Society will be held at Albany, N. Y., Friday and Saturday, May 11 and 12, 1906. Saturday afternoon will be devoted exclusively to clinics.

Any ethical member of the profession having anything of interest to present, or desiring to clinic, will kindly communicate with the clinic committee.

F. Messerschmitt, chairman, 1023 Granite building, Rochester, N. Y.; W. D. Tracy, 46 West Fifty-first street, New York City; G. B. Mitchell, 448 Porter avenue, Buffalo, N. Y.; G. A. Sullivan, 18 Dove street, Albany, N. Y.; F. W. Proseus, 238 Monroe avenue, Rochester, N. Y.

PATENTS OF INTEREST TO DENTISTS.

808,606. Holder for toothpicks and similar articles. Charles F. Hamel, Toledo, Ohio.

808,105. Dentifrice. George W. Morse, Jersey City, Mo.

808,841. Apparatus for the manufacture of toothpicks. Henry S. Hopper, Detroit, Mich.

808,935. Handle for dental flasks. Theodore G. Lewis, Buffalo, N. Y.

808,690. Dental silk box. Otto C. Schulz, Chicago, Ill.

809,365. Dental tool. Adam W. Feltmann, Chicago, Ill.

Copies of above patents may be obtained for ten cents each by addressing John A. Saul, solicitor of patents, Fendall building, Washington, D. C.

THE

DENTAL REVIEW.

Vol. XX. CHICAGO, APRIL, 1906. No. 4.

ENAMEL OF THE TEETH DECALCIFIED BY THE CELLOIDIN DECALCIFYING METHOD AND EXAMINED WITH ULTRA VIOLET LIGHT.

BY C. FRANCIS BÖDECKER, D. D. S., BERLIN, GERMANY.

Ultra-violet light used in connection with the photographic camera is a valuable aid to the histologist, enabling him to obtain higher magnifications and greater detail in microphotographs than has heretofore been possible. Williams'[1] opinion of the value of microphotographs may be seen from the following: "We do not care for the most clever and artistic drawings, which, after all, may represent nothing beyond an idea of the mind. You are a student of nature, an experimenter, an investigator. Show us what you have seen. It is now a simple, easily demonstrated fact * * * that in histological work it is possible to show, by means of microphotography (old method) all that any human eye can see, and to this test all present and future discovery in this field must be brought." Williams is certainly right in the position he takes in regard to microphotography, but at the time of the investigations of Heitzmann, Abbott and Bödecker, the process of microphotography was not perfected to such a degree that good reproductions of specimens could be made. It is a well known fact that some of the older microscopists had such perfect eyesight as to be able to see, with the lenses of moderate power then at their disposal, and to describe minute structures in tissues that the average investigator of today can only observe by the aid of our most perfect lenses. This is the reason why the existence of some of the minute structures was doubted by the contemporary investigators. The existence or non-existence of the minute organic structures of the enamel can be demonstrated by the new method of microphotography, for photographs can be made by the aid of ultra-violet light which not only far exceed the ordinary ones in detail and definition, but in some cases show even more than it is possible to see by subjective observation.

---

[1] Williams, J. Leon. Formation and Structure of the Dental Enamel. *Dental Cosmos,* Vol. XXXVIII, page 458.

To give a minute description of the theory upon which this apparatus is based, is beyond the scope of this paper, but as this subject is comparatively new, I will give a brief explanation of the apparatus itself. The most effective rays of daylight are said to have a wavelength of $0.550\,\mu$; but these are somewhat reduced after passing through a microscopic specimen, placed in a clearing medium, as balsam or oil of cloves. A great difference in the degree of transparency and clearness can be noticed in comparing a specimen in water with one in balsam. This difference is dependent upon the relative wavelength of the light passing through the medium in which the specimen is imbedded. The greater the power of this medium to shorten the wavelength, the clearer will be the image thrown upon the retina or upon the photographic plate. The ultra-violet rays have a wavelength of $0.275\,\mu$ (275 millionth millimeter), or about half that of daylight. Consequently by employing these it is possible to obtain greater definition and higher magnification than by using white light. The good results obtained by using a light with short wavelength has been known for a long time, and as far back as 1871 Castracane[2] used the green and blue rays of the sun's spectrum for illuminating microscopic specimens. But few scientists have availed themselves of this method, because the illuminating apparatus was too complicated and the results not worth the added trouble and expense. So it was not until about a year ago that Köhler[3] finally completed a microphotographic apparatus whose source of illumination is pure ultra-violet light. A short description of the apparatus is as follows:

---

[2] Castracane, F., Su la illuminazione monocromatica del microscopio e la fotomicrografia e loro utilità. Atti dell'Accademia Pontificale di nuovi Lincei. XXIV, 1871.

[3] Köhler, A., Microphotographische Untersuchungen mit ultra-violettem Licht. Zeitschrift für wissenschaftliche Mikroscopie. Band XXI. S. 129 and 165.

The light for this apparatus is generated by an electric spark passing between two magnesium electrodes. The ordinary street current, after passing through an interrupter, is led to an induction coil, whose secondary current, after passing through a Leyden jar, reaches the magnesium electrodes. From this point the light passes through two prisms which break it up into a widely spread spectrum. By moving the optical bench which supports the source of light as well as the prisms, the pure ultra-violet rays may be selected and thrown into the prism set in the foot of the microscope, which reflects the light through a condenser to the specimen above (Fig. 1).

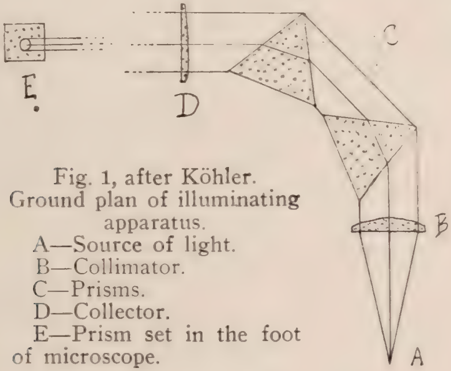


Fig. 1, after Köhler.
Ground plan of illuminating apparatus.
A—Source of light.
B—Collimator.
C—Prisms.
D—Collector.
E—Prism set in the foot of microscope.

Either magnesium or cadmium wires may be used as electrodes. If the former are employed, the light has a wavelength of 0.280 μ, and the finished photograph will show a greater depth of focus, while with cadmium electrodes, furnishing a light with a wavelength of 0.275 μ, the photograph will show more definition, as in this case the focus is confined to a more limited optical plane. However, as the magnesium electrodes give a more intense light, it is preferred by most operators. The chief difficulty encountered in constructing this apparatus was that ordinary glass absorbs the ultra-violet rays. Quartz and fluorspar are the only bodies through which these rays will pass, but it was impossible to construct high power lenses from these on account of their friability. Even ordinary slides and cover glasses absorbing too much light, have also to be made of quartz.

This difficulty was solved when Herschowitsch[4] finally succeeded in fusing quartz into a homogeneous mass. The fused quartz, being an expensive product and obtainable only in small pieces, is used only where absolutely necessary, as in the objectives and cover glasses. All other parts through which the light passes are made of specially selected quartz, ground in such a manner that the crystals lie parallel to the optical axis, and in this way not causing any noticeable refraction. It was impossible to use ordinary quartz for cover glasses or lenses, as it could not be ground down to sufficiently thin a piece without cracking.

Specimens mounted in the ordinary manner can not be examined with ultra-violet light, but must be mounted on a quartz slide and cover, avoiding all media which absorb ultra-violet light. Canada balsam and oil of cloves, absorbing ultra-violet rays, can not be used; glycerine, oil of vaselin, normal salt solution or water being used instead. This, naturally, is a disadvantage, but the results obtained by the use of this apparatus are nevertheless worth the trouble.

The monochromatic objectives, so-called because they are corrected only for monochromatic light of certain wavelength, are useless when used with white light. For subjective observation this apparatus is of less use than the ordinary microscope; its real advantage, however, appears when the finished photographs are examined. The difficulty of making subjective observations is not as great a disadvantage as it might appear at first sight. The main point is to be able to show the results of your work and convince the profession of the correctness of your observations. The magnifications obtainable are from 250 to 2,500, while with specially adopted specimens and with the strongest eyepiece, a magnification of 3,600 may be reached. These high magnifications are not produced by using greatly extended camera bellows, but partly through eyepiece enlargement and partly because of the higher magnification of the objective itself. When the distance between the ground glass of the camera and the eyepiece is 38 inches, the ordinary 2 mm., apochromatic immersion lens of Zeiss with the lowest compensating eyepiece furnishes an enlargement of 1,000. If the next eyepiece, No. 4, is used, an enlargement of 2,000 is obtained, but at the same time

---

[4] Herschowitsch, M., Ueber die Umwandlung des Bergkristalls in den amorphen Zustand. Zeitschrift f. phisik. Chemie. Bd. XLVI, 1903.

Zeiss gives in their table of enlargements a column headed "Upper limit of serviceable enlargements," and here the figure of 1,480 will be found opposite their best immersion lens. The enlargement of this, their best apochromatic objective, by itself, is 125, while that of the best monochromatic immersion lens is 180. The monochromatic eyepieces have have enlargements varying from 5 to 20 times; so that when these are used with the monochromatic immersion lenses, they give magnifications up to 3,600. The image produced by the monochromatic objectives can be enlarged many times by the eyepiece, because it has twice as much definition as that produced by the ordinary lens, the comparative numerical apertures of the objectives being 2.50 to 1.30. In making the photographs, two factors combine to shorten the exposure. One is that the ordinary plate is extremely sensitive to blue light. The other that the distance between the eyepiece and the ground glass never exceeds 12 inches, while the common length of bellows used in ordinary microphotography may be as much as 50 inches. So it is quite comprehensible that in high enlargements by the old method, the exposure becomes long, thus increasing the danger of "fuzzy" photographs due to the vibration of the camera. The exposure with ultra-violet light varies from a fraction of a second to about 30 seconds, according to the degree of magnification and the density of the specimen to be photographed.

Water chambers to cool the rays, as used in connection with the arc lamp in ordinary microphotography, can be dispensed with, as the source of the ultra-violet light generates almost no heat. The amount of current consumed by this lamp is about 4 amperes, while the arc lamp, used in the ordinary apparatus, takes 20 amperes. This places another advantage to the credit of the ultra-violet apparatus, for in this case the electric current can be taken from an ordinary wire, while a special cable to feed a 20-ampere arc lamp is necessary.

The greatest advantage, however, of this method is that the different tissues show a different degree of absorption of the ultra-violet rays, thus producing a variety of tones in the finished photograph, corresponding to the different tissues. This natural differentiation of tissues imitates quite closely the action of the different stains known in the histological technique. In this manner the nucleus absorbs almost all the light and consequently appears fairly dark in the finished photograph. The rest of the cell contents allows considerably more light to pass through, making a nice degree of contrast between it and the nucleus (Fig. 2). Greater contrast, though at the expense of the half-tones, can be obtained by first staining the specimen. The natural differentiation produced by this light allows the histologist to examine tissues in a fresh condition. This will probably prove of great advantage to the pathologist, who can now photograph fresh disease tissue without first fixing and staining it. It is also of advantage to the dental histologist, for it enables him to decalcify the enamel under the cover glass and photograph the process in every stage.

The enamel is one of the most difficult structures to study microscopically on account of the great amount of lime salts it contains. Most of the leading men in the field of histology have at one time or another worked upon this tissue, and the opinions, especially upon the question whether it does or does not contain any organic matter, were quite divergent. Charles S. Tomes, J. Leon Williams and others claim it to be so thoroughly calcified that there is no trace of organic matter, basing their assertions partly upon the difficulty or even the impossibility of staining it, as well as upon the chemical analysis of this structure. It seems that quite a few members of our profession have been able to stain enamel, among others Caush[5] with fuschin in a hot chamber, and my father with gold. It is true, as Williams[6] mentions in his excellent paper on the "Pathology of the Enamel," that the fuschin method does not absolutely prove the existence of organic matter, for the stain might be precipitated on the walls of spaces in the enamel. I have stained enamel intensely with nitrate of silver, showing a marked contrast between the prisms and the interprismatic substance, but place no reliance upon that, as this stain furnishes no absolute proof of organic matter. That the enamel contains organic matter, nevertheless, and that, in greater quantities than has heretofore been supposed, is my firm conviction, based upon the fact that I have been able to stain and section the organic matrix on the microtome to the thinness of 5 μ.

---

[5] Caush. International Dental Congress, St. Louis, 1904.

[6] Williams, J. Leon. A Contribution to the Study of Pathology of Enamel. *Dental Cosmos,* Vol. XXXIX. No. 4.

The chemical analysis of enamel has been undertaken many times, yet it has been rare indeed that the results have not differed. Von Bibra places the amount of organic matter in adult enamel at 5.97 per cent. Charles S. Tomes[7] claims in his work on "Dental Anatomy" that these 5 to 6 per cent are really the water of crystallization of the lime salts, and that this can not be driven off except under very high heat. It is probable that there is a minute quantity of water that can not be easily driven off, but I consider it doubtful whether it can amount to 5 or 6 per cent. During the prolonged desiccation of the enamel preparatory to its chemical analysis, all water contained in the organic matrix will necessarily have been driven off. If then the chemical analysis reveals 5 or 6 per cent of organic matter, and as organic matter contains at least 50 per cent of water, we must arrive at the conclusion that the organic matrix in the fresh enamel amounts to at least 7 to 10 per cent by weight. After comparing the specific gravity of the inorganic salts with that of the desiccated matrix we must admit that the mass for each per cent of the matrix is greater than that of the salts. If, then, the per cent of organic and inorganic matter were reckoned by mass instead of weight, the volume of the organic matrix in fresh human enamel would surely be found to be over 12 per cent. This corresponds as near as the eye can judge to the amount of organic material left after decalcification.

In the May issue of 1905 of THE DENTAL REVIEW I gave a short description of the celloidin decalcifying method by which it is possible to decalcify enamel without losing any of the organic matrix. The reason that this method furnishes such good results is that as soon as the acid dissolves the lime salts, the celloidin fills up the space occupied by these, and in this manner sustains the fine organic matrix of the enamel.

Before I go on to a more exact description of this method I wish to emphasize that the decalcification of enamel takes considerable time and that great patience is required to obtain good results. If the procedure is hurried the organic envelopes are so deranged that it becomes impossible to make any use of the resulting specimens.

In selecting the enamel to be decalcified by this method it is best to use teeth which have been fixed soon after extraction. The best fixing agents for enamel that I have found are absolute alcohol or a saturated solution of bichlorid of mercury. Most of the other agents, as Zenker's, Flemings or Müller's fluid, contain some weak acid as acetic, picric or chromic, which already starts the decalcification during the fixing process.

---

[7] Tomes, Charles S., A Manual of Dental Anatomy. P. 13.

In cutting sections of enamel and dentine from the tooth I find that I can work most quickly with a diamond disk, such as is used in preparing a tooth for a shell crown. This will cut much faster than a jeweler's saw, but it is necessary to hold both the disk and specimen under water to prevent the latter from being dried out by the heat. It is not advisable to have too much dentine adhering to the specimen, as the former decalcifies much slower than the enamel. This is due to the fact that the percentage of organic matter is much higher in dentine, thereby preventing the free circulation of the decalcifying medium. The specimen most suitable is a cross section of a bicuspid some distance above the pulp chamber. It should be cut so that there are two islands of dentine, each surrounded by enamel. (Fig. 3.) If the section is cut in this manner the small amount of enamel left between the two dentinal cusps is supported from two sides and it is therefore at this point that the least deranged prism envelopes are found. It is not advisable to cut the section thicker than $\frac{1}{16}$ of an inch, for even with this minimal thickness, it takes several months to decalcify.

A suitable section having been cut, it is slowly dehydrated by placing it at first in 40 per cent and then in 80 per cent alcohol. If bichlorid of mercury has been used as a fixing agent it is necessary to wash thoroughly (twelve hours in running water) and to prevent the deposition of crystals of bichlorid of mercury in the specimen a few drops of iodine are added to the 80 per cent alcohol. After this the section is allowed to remain in the absolute alcohol for at least twelve hours. Then it is placed in a mixture of ether and alcohol, equal parts, in which it remains for one hour. It is then decalcified in a medium consisting of a fairly thin solution of celloidin to which 10 per cent of pure nitric acid has been added. This solution has to be prepared most carefully in order to avoid a precipitate. To make about 30 cc., take 10 cc. of ether and absolute alcohol, equal parts, and add 2 cc. of nitric acid; mix thoroughly and add 20 cc. of a celloidin solution of medium consistency. This mixture should be stirred constantly with a glass rod while the acidified ether and alcohol is being added drop by drop. In order to prevent undue evaporation of the ether, the mixing should be done as quickly as possible. The solution, then having the consistency of thin molasses, is placed together with the section in a glass dish which has an absolutely air-tight cover. Too much stress can not be laid upon this point, for the ether evaporates with great rapidity. This was one of my chief difficulties, and in my previous paper I advised the practice of adding about 20 drops of ether and alcohol every few days. But now I place the glass dishes containing the specimens in a second, considerably larger, vessel, whose atmosphere I keep saturated with ether and alcohol. This obviates the necessity of uncovering the specimen for about two weeks and thus keeping the celloidin of uniform consistency. If the celloidin is allowed to become too thick the decalcification will cease, as the free circulation of the acid can not take place. On the other hand, when too much ether and alcohol is added the solution becomes so thin that it will no longer support the fine organic envelopes, but will allow them to sink down into one mass. After the specimen has lain in the acid celloidin for 24 hours, the enamel assumes a chalky appearance. For some time no change is noted, till the end of about the third week, when the enamel becomes slightly transparent at the dentinal margin. This transparency slowly travels to the outer margin of the enamel. If the decalcification seems to come to a standstill at the end of a month, as sometimes happens when the specimen is large, allow the celloidin to become somewhat thicker and then add a little more (½ cc.) acid together with the ether and alcohol. When decalcification has progressed so far that the enamel appears transparent, the celloidin is allowed to harden slowly. To harden the celloidin the cover of the dish is removed on the first day for about ten minutes, on the second for double the time, and thereafter increasing the length of exposure from day to day until the celloidin has reached the desired hardness. This process of evaporation should not, however, be prolonged until the celloidin begins to draw away from the walls of the vessel, as such contraction would necessarily disturb the arrangement of the organic structures in the decalcified enamel. A block is then cut out, leaving at least ¼ of an inch of celloidin around the specimen. I have found it advisable to add a few drops of ordinary celloidin, which hardens in about ten minutes, to the under surface of the block where the specimen has lain in contact with the glass, thus preventing any protrusion of the specimen, should further contraction of the block take place. This block is then placed for two hours in 80 per cent alcohol. After remaining another two hours in 40 per cent alcohol it is placed in water for two hours and then in a 5 per cent watery solution of alum; in this it is left for at least 24 hours, changing the solution several times. It is thereafter washed for some hours in running water and slowly brought through the ascending percentages of alcohol to 96 per cent, but no higher; otherwise the celloidin becomes too soft. After the acid has once been neutralized by the alum, the block of celloidin may be kept in 80 per cent alcohol for any length of time. In changing the block from one solution to another it frequently happens that the celloidin becomes cloudy. This does not harm the specimen, but it is necessary to let it remain until it is clear in the solution which caused the cloudiness.

When first I devised this method, in sectioning the celloidin block, I could obtain sections no thinner than 25 to 30 μ, which was probably due to the fact that the celloidin had suffered through the action of the acid. Such sections were, of course, entirely too thick for exact observation. Another difficulty encountered with these sections was that the celloidin stained as well as the enamel, the anilin dyes being the most active in this respect. The investigator can, nevertheless, convince himself of the presence of organic matter in such sections, even if he does not wish to continue the process. Fair specimens can be obtained by staining in haematoxylin and differentiating in 50 per cent alcohol, to which 1 per cent of hydrochloric acid has been added. After staining, it is simpler for the purpose of examination to mount the celloidin section in glycerine than to mount it in balsam, as in this case it must first pass through a complicated process of dehydration.

To prevent the celloidin from taking up the stain, I tried many ways out of the difficulty, but found that the only way was to remove the celloidin entirely, which almost ruined the specimen in every instance. I also tried to stain the section before decalcification, but every trace of the stain was destroyed by the acid. Chlorid of gold is the only stain which is not affected, but this when used to stain large sections in toto does not furnish very satisfactory specimens. Finally, I imbedded the celloidin block in paraffin. This process is called "double imbedding," and was first used by Heider and afterward perfected by Kultschitzky.[8] He saturated the tissue which he wished to examine in a solution of celloidin, then placed it in origanum oil, and afterward imbedded in paraffin. But in my case, not only had I to work with hardened celloidin, but also with a block containing at least 5 per cent of water. The water had first to be removed, otherwise the paraffin could not penetrate the block and specimen thoroughly. The water may be extracted in several ways. Absolute alcohol is, of course, out of the question, as it dissolves the celloidin, while creosote,[9] whose action is no better than that of analin, I discarded on account of its penetrating odor. Anilin is less offensive and ordinarily I prefer it to the other agents. It is, however, not procurable everywhere, so I have used carbolic acid with equally good results. Care must be taken to obtain the pure white crystals which have not taken up any water. These are melted and added to double the quantity of chloroform, this solution being used in the same manner as the anilin described below. After the celloidin block comes out of the 95 per cent alcohol it is placed in several changes of anilin for 24 hours. To the last change I add 25 per cent of chloroform. Xylol, instead of chloroform, as used by most histologists in the ordinary paraffin method, is objectionable in double imbedding as it hardens the celloidin as well as the specimen. More chloroform is added after an hour, and finally it is placed in pure chloroform. This should also be changed two or three times so as to remove all traces of anilin. Never hurry this process, otherwise water will be left in the block and thus prevent the paraffin from penetrating. The time indicated during which the celloidin block remains in each of the solutions is the shortest; if prolonged it can not harm the specimen. After the celloidin block has remained for some hours in the pure chloroform, a few pieces of low fusing paraffin (45° c.) are added to make a saturated solution. In this the block stays another six hours. Then, after adding a little more paraffin, it is placed on top of the paraffin stove. After an hour, when slightly warm, it is placed in the stove in low fusing paraffin for 24 hours and then for 12 hours more in high fusing paraffin (58° C.). Then it is poured and cooled in the same manner. On account of the difficulty of saturating the celloidin, the block must remain in the paraffin longer than is necessary with ordinary tissues. But at the end of the process it is so thoroughly saturated that these compound sections of celloidin and paraffin, when left in the open air, show no shrinkage whatever. As I mentioned in the first part of this paper, very thin sections may be obtained. I have even managed to get some section of 2 μ in thickness by the aid of mastix dissolved in ether, applied to the surface of the block and allowed to dry a few minutes, but I find 5 and 10 μ sections the most practical.

---

[8] Kultschitzky, Zeitschrift f. Wissentschaftliche Mikroscopie, Bd. IV, 1887.

[9] Pavlow, W., Kreosot als wasserentziehendes Mittel. Zeitschrift f. Wiss. Mikroscopie. Bd. XXII, 1905.

To mount the sections on the slides I use the "Japanese method," so-called from the Japanese scientist, Ikeda. An extremely small amount of white of egg and glycerine is applied to an absolutely clean slide and rubbed over the entire surface with the ball of the finger until no visible trace remains. The thinner this film the better the sections will adhere. A drop of distilled water is then placed upon the prepared surface and the sections floated upon this. The slide is then placed upon the top of the paraffin stove where the temperature should not be above 45° C. Here it remains for 24 hours till every trace of water has evaporated; the sections will have become perfectly flat. If any slight wrinkles should remain in the celloidin, press them down carefully with the tip of the finger. The above described method I have found the most efficient, but if the sections are to be mounted for examination with ultra-violet light, it can not be used, as the white of egg is optically stained by these rays, causing a smudge over the entire photograph. So the use of albumin glycerine must be omitted and the sections stuck on by simply letting the water evaporate. It works almost as well, only more care must be exercised in the after treatment of the specimens.

The last stage in the preparation of the specimen is the removal of the celloidin and paraffin and the staining. The entire ensuing manipulation must be done carefully; above all, never cause any strong currents in the fluids, which may tear the specimens from the slide. First the slide, with the attached specimen, is placed in Xylol; this dissolves the paraffin in about a minute, then, after wiping off all excess Xylol, into absolute alcohol. Next to dissolve the celloidin, it is placed in ether and alcohol, equal parts, in which it remains for about five minutes. The slide then goes back for a minute into absolute alcohol, and then through the descending percentages of alcohol into water. Now all traces of the celloidin and paraffin have been removed and any stain can be used.

The most suitable stain for the organic matrix of the enamel is Weigert's haematoxylin, used according to the method of M. Heidenhein. The specimen is first placed for three hours in a 2½ per cent watery solution of iron alum, after which it is washed in distilled water, and over-stained in Weigert's haematoxylin (one hour). It is again rinsed in water and the excess stain extracted by again placing it in the iron alum solution. The resultant stain is not as striking as many of the double stains, but the specimens show a beautiful gradation of sepia tones. After dehydration the complicated process is at an end, and the specimen mounted in balsam is then ready for examination by ordinary light.

Stages of the celloidin decalcifying method through which a specimen passes after fixing:

Medium.	*Time.*
Alcohol, 40 per cent	1 hour.
Alcohol, 80 per cent	½ hour.
Alcohol, 96 per cent	½ hour.
Absolute alcohol	12 hours.
Ether and alcohol	1 hour.
Acid celloidin	1 to 6 months.
After decalcification—	
Alcohol, 80 per cent	2 hours.
Alcohol, 40 per cent	2 hours.
Water	2 hours.
5 per cent watery solution of alum	24 hours.
Running water	5 hours.
Alcohol, 40 per cent	1 hour.
Alcohol, 80 per cent	½ hour
Alcohol, 96 per cent	1 hour.
Carbolic acid and chloroform or Anilin, } Several changes	24 hours.
Add chloroform—	
Pure chloroform	12 hours.
Chloroform and paraffin	6 hours.
Low fusing paraffin	24 hours.
High fusing paraffin	12 hours.

After specimen is imbedded in paraffin and sections cut and attached to slides—

Xylol		1 minute.
Absolute alcohol		1 minute.
Ether and alcohol		5 minutes.
Absolute alcohol, Alcohol, 96 per cent Alcohol, 80 per cent Alcohol, 40 per cent Aq. dist.,	in each solution	1 minute.

To Stain—

2½ per cent watery solution of iron alum		3 hours.
Aq. dist.		1 minute.
Weigert's Hæmatoxylin		1 hour.
Aq. dist.		1 minute.
Iron alum solution		2 to 5 minutes.
Aq. dist.		1 minute.
Alcohol, 40 per cent Alcohol, 80 per cent Alcohol, 96 per cent Absolute alcohol, Xylol, Balsam,	in each solution	1 minute.

J. Leon Williams[10] states that: "Enamel is a solid mineral substance, and the finest lenses reveal not the slightest difference between the enamel ground moist from a living tooth and that which has lain in the earth for a hundred centuries." At another place he challenges the "Heitzman school to select dried or even fossil specimens of enamel from any given number of microscopical preparations of this tissue." It is true that this is difficult, due to the fact that our histological knowledge of the organic structure of fresh enamel is still limited.

Not more than twenty-five years ago all tissues used for histological purposes were obtained from the hangman or the slaughter-house, two or three days after the death of the subject. At that time the histologist did not think that it made any difference how soon the tissues were fixed. Now he knows that specimens showing their true structure, as found in the living organism, can only be obtained by fixing the tissue immediately upon the death of the individual. When the exact histological appearance of the normal organic matrix of the enamel is known, I have no doubt it will be possible to easily differentiate between a fresh and a fossil specimen. It is still more difficult to discern the difference between enamel ground moist or dry, for in this tissue the organic matter is so imbedded in inorganic material that desiccation and contraction only take place slowly.

---

[10] Williams, J. Leon, *Dental Cosmos,* Vol. XXXVIII, p. 457.

The organic matrix or reticulum of the enamel consists of organic envelopes, enamel lamellae and tuft-like processes. A delicate organic envelope, which might also be called the interprismatic substance, surrounds each enamel prism throughout its entire length. Figs. 4 and 5 are cross sections of decalcified enamel in which these envelopes are clearly seen surrounding spaces occupied by the prisms previous to decalcification. It is also evident that a separate envelope for each prism exists and at "a" in Fig. 5, where three prisms adjoin, a triangular space is noted. Whether this was originally filled with the same inorganic material constituting the prisms, or whether these spaces are simply due to a dislocation of the envelopes, is hard to say. Fig. 5 is an enlargement of 2,500, demonstrating the clearness with which high power photographs can be made with ultra-violet light. C. F. W. Bödecker[11] claimed that fibers run between the enamel prisms. A glance at Fig. 6, which is a longitudinal section of decalcified enamel, would apparently substantiate this claim, for here only the longitudinally cut walls of the envelopes are seen, appearing as fibers running between the prisms. Further examination of this figure shows that at the upper right hand corner the envelopes are clearly defined, while this is not the case in the left upper corner. The reason for this difference is easily understood by observing that in Fig. 5, if a section were made at the line b, the envelopes being cut at right angles to their surface, would appear as in the right upper corner of Fig. 6; on the other hand a section made along the line c of Fig. 5, that is tangentially to the surface of the envelopes, would have the same appearance as the upper left hand corner of Fig. 6.

Williams,[12] in proving the non-existence of organic fibers between the prisms, in his paper on the "Study of the Pathology of the Enamel," says: "Fig. 45 is from a specimen of nearly decalcified enamel. The light line on the left side of the specimen is a line of striation caused by imperfect calcification. This specimen was mounted in glycerol, and pressure upon the coverglass showed that the portion outside the line of striation moved slightly, but was held to the main mass by delicate fibers, which were not between the rods but which constituted the organic basis of the rods themselves." In speaking of the next illustration he goes on to say: "One can clearly see just where the last calcific remains of the globular bodies are disappearing, and projecting beyond these points are seen the faint, ghost-like forms which constitute the organic substructure of the enamel-rods." This may disprove the existence of fibers, but proves that each prism is enclosed in an organic envelope, which collapses as the acid slowly dissolves the body of the prism.

---

[11] Bödecker, C. F. W., Anatomy and Pathology of the Teeth.

[12] Williams, J. Leon, *Dental Cosmos,* Vol. XXXIX, p. 278.

In the walls of the organic envelopes minute quantities of lime salts are deposited, making perfectly calcified normal human enamel appear to be almost homogeneous. The first action of the acid (Fig. 7) in attacking the enamel is to dissolve this deposit in the envelopes, causing the individual prisms to become more apparent. When, however, this deposit of lime salts has been removed by the action of the acid, the organic envelopes are no further acted upon. Fig. 14 is a photograph of a ground section of enamel in the first stages of decay showing an appearance similar to that of the first stage of decalcification.

The lamellae are sheet-like processes of organic matter originating at the dentinal margin and passing to the outer boundary of the enamel. As these organic formations have never been described, I have adopted for them the name of "enamel lamellae." Unlike the envelopes surrounding the enamel prisms, the lamellae are composed of pure organic matter in which no lime salts have been deposited. Owing to the remarkable similarity of these lamellae to cracks, they have always been regarded as such. The following photographs, however, clearly show the difference between a crack and an enamel lamellae. Fig. 8 is a photograph of a ground section of enamel and dentine, decalcified under the cover glass, in which an enamel lamellae is clearly seen standing up like a tent-pole supporting the rest of the more delicate organic enamel structures. If this had been a crack, filled with particles of dirt during the process of grinding, it certainly would not have held together so well after the surrounding enamel prisms had been removed by the action of the acid. A higher enlargement of this lamellae is seen in Fig. 9. Fig. 11 is a cross section of decalcified enamel showing how a crack appears

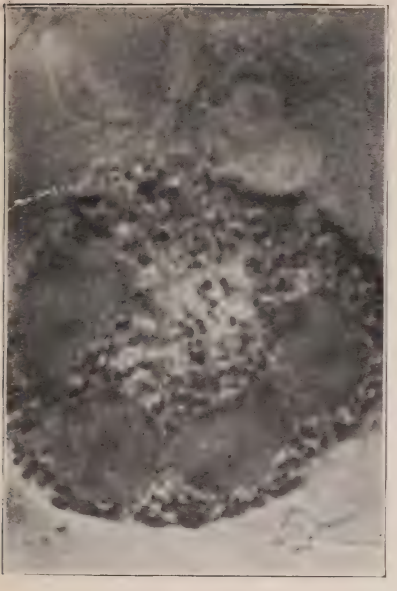


Fig. 2

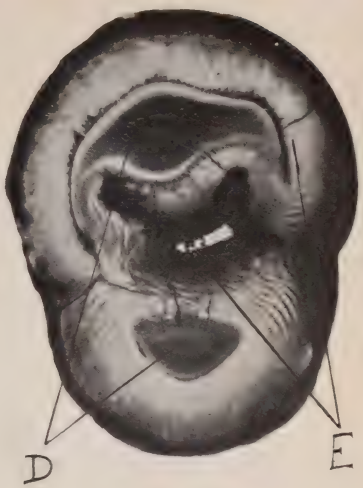


Fig. 3

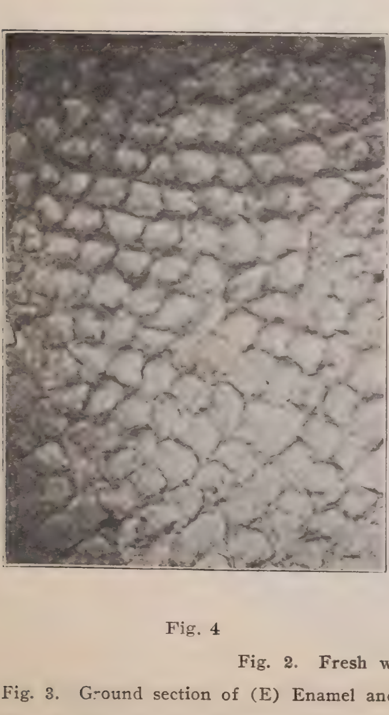


Fig. 4

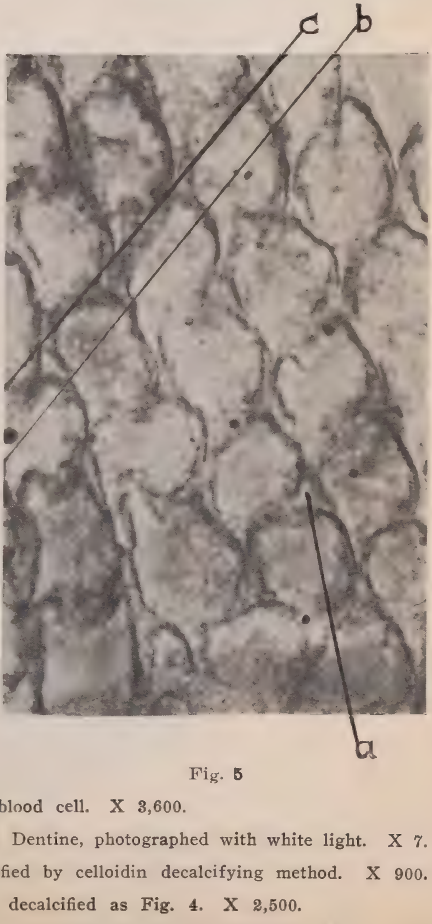


Fig. 5

Fig. 2. Fresh white blood cell. X 3,600.

Fig. 3. Ground section of (E) Enamel and (D) Dentine, photographed with white light. X 7.

Fig. 4. Cross section of enamel prisms, decalcified by celloidin decalcifying method. X 900.

Fig. 5. Cross section of enamel, decalcified as Fig. 4. X 2,500.

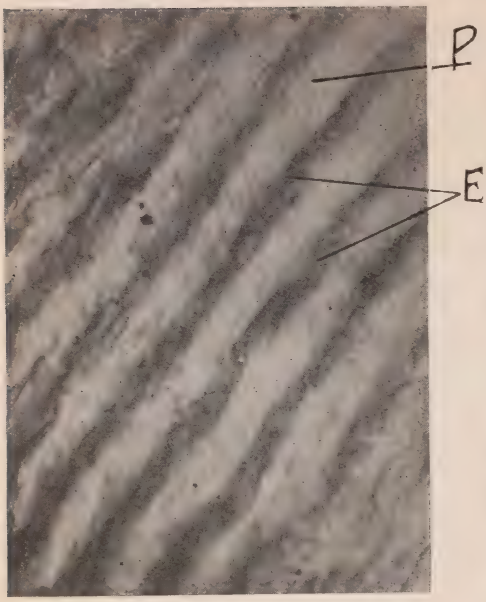


Fig. 6

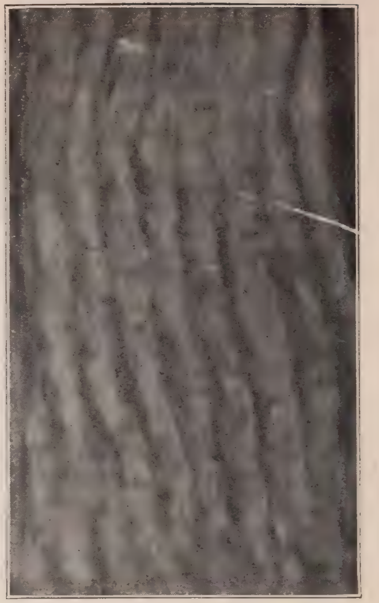


Fig. 7

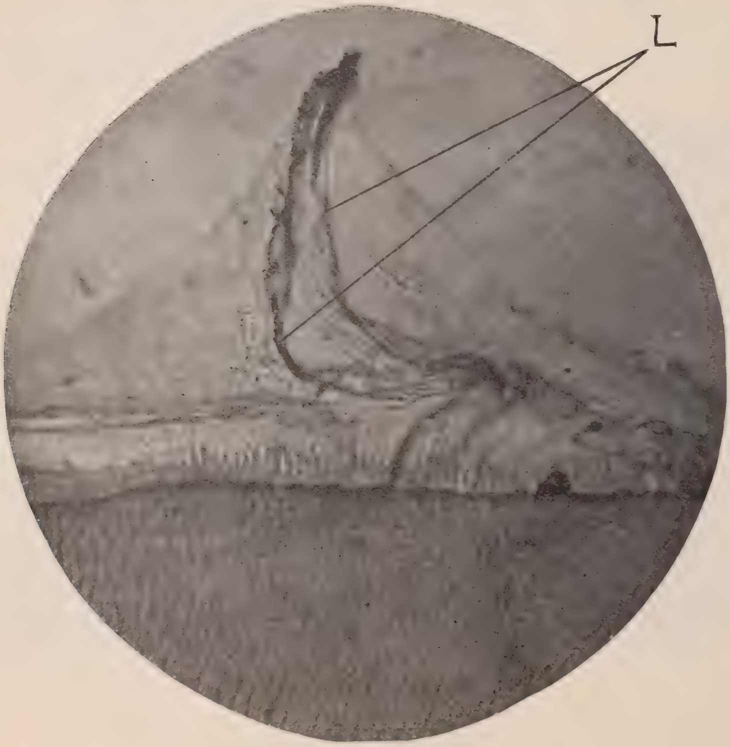


Fig. 8

Fig. 6. Longitudinal section of decalcified enamel prisms. E—Enamel prism envelopes; P—Space left by dissolved prism. X 1,800.

Fig. 7. Ground section of enamel treated with 5 per cent nitric acid. X 700.

Fig. 8. Enamel and dentine decalcified under the coverglass. L—Enamel lamella. X 250.

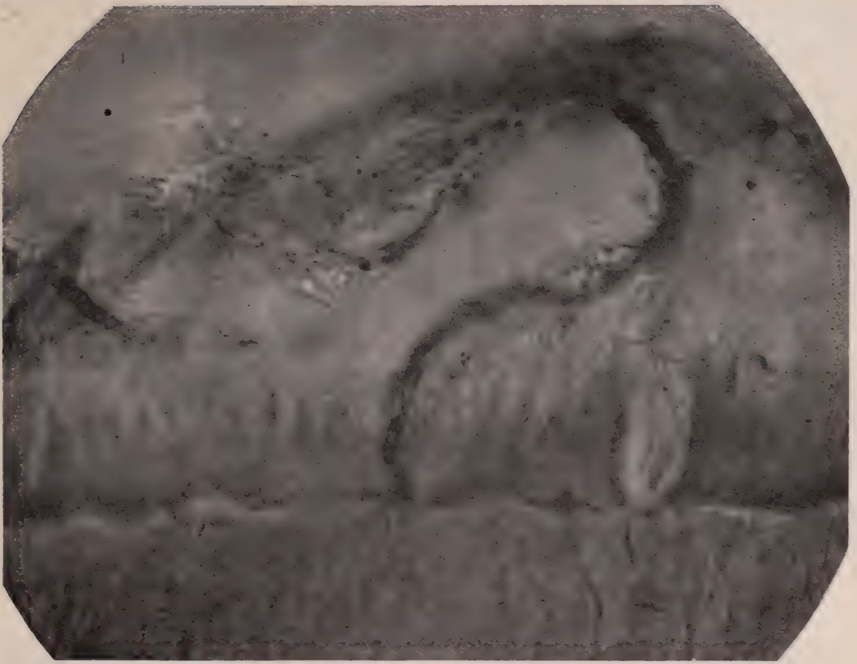


Fig. 9

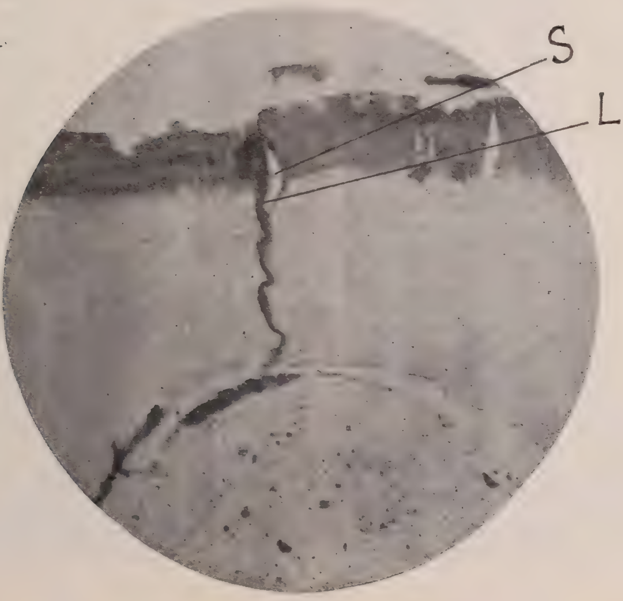


Fig. 10

Fig. 9. Same as Fig. 8, showing lower part of the lamella. X 900.

Fig. 10. Enamel and dentine decalcified by the celloidin decalcifying method. Previously stained en bloc with chloride of gold which has penetrated the enamel but partially. Shows space (S) on the side of a lamella. (L) Photographed with white light. X 70.

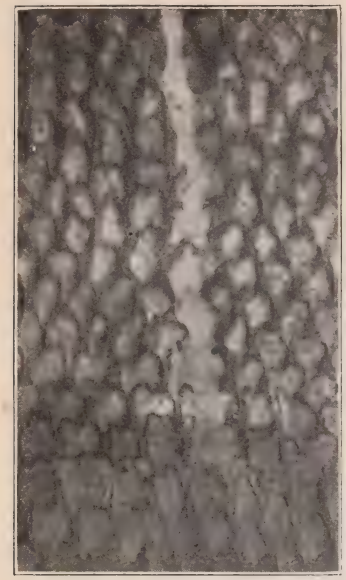


Fig. 11

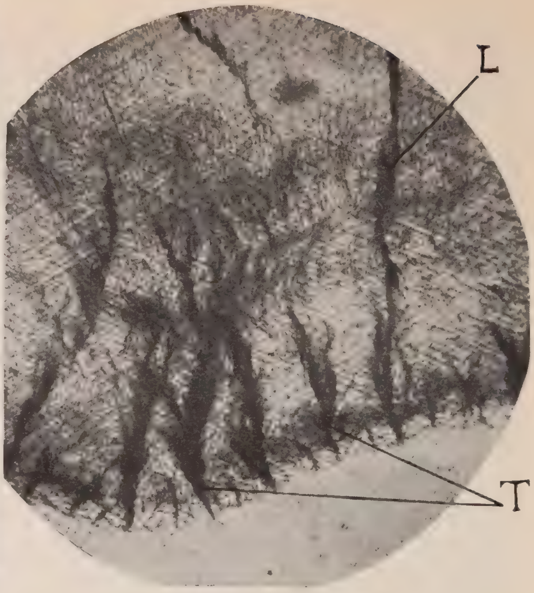


Fig. 12

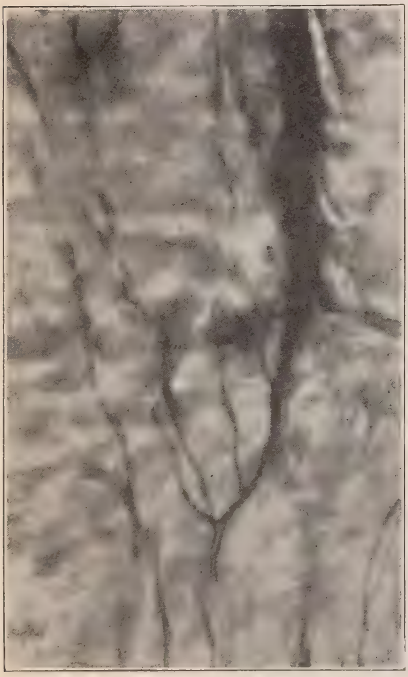


Fig. 13

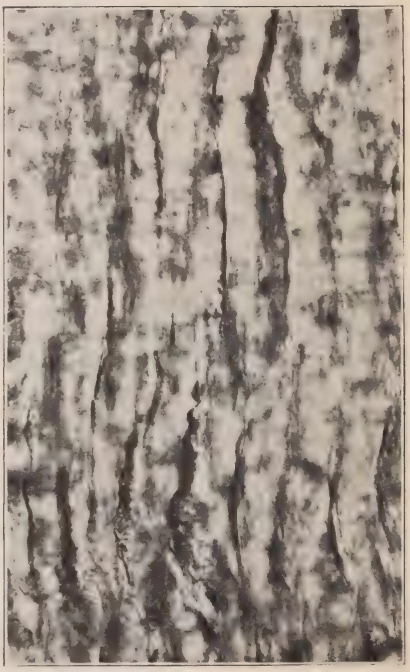


Fig. 14

Fig. 11. Cross section of decalcified enamel showing a crack. X 900.

Fig. 12. Ground section of temporary enamel showing a lamella (L) and tuft-like processes. (T). Photographed with white light. X 70.

Fig. 13. Ground section of enamel and dentine showing communication of dentinal fibers with lamellæ. X 1,000.

Fig. 14. Ground section of enamel in first stages of decay. X 900.

in a photograph made by ultra-violet light. Fig. 10 is a photograph made with ordinary light of a section of enamel and dentine, stained en bloc with chloride of gold and decalcified by the celloidin decalcifying method. Near the outer margin the organic envelopes have pulled away from the lamellae, leaving a space (S), which again shows that lamellae are made up of compact sheets of organic matter. This figure also shows the interesting fact that the lamellae may be the entrance point of bacteria, for at the bottom of the photograph a mass of decayed dentine can be seen.

A modification of the lamellae is often found which I have named "tuft-like processes," because they appear, in a ground section, like tufts of grass springing from the margin of the dentine and running quarter or rarely half way to the surface of the enamel. Both lamellae and tuftlike processes are more numerous in the enamel of temporary than that of permanent teeth. Fig. 12 is a photograph of a ground section of enamel from a temporary tooth made by white light in which a lamella and a great number of tuft-like processes are seen.

Caush[13] describes organic structures in the dental enamel which he calls a system of tubes, and attributes to them, among others, the following function: "To allow for any expansion or contraction that may take place in the enamel." The organic matrix undoubtedly has this function, but it is obvious that a system of tubes would be of no use in equalizing the strain during expansion and contraction of the enamel.

The enamel lamellae, frequently being the point of entrance of bacteria, are pathologically significant in the origin of caries. I am at present making a further study along the lines laid down in this paper of the histology and pathology of the enamel and hope to publish the results in the near future.

All photographs illustrating this article were made by the aid of ultra-violet light unless otherwise mentioned, and no specimens were stained except the one depicted in Fig. 10.

---

[13] Caush, D. E., "Is There Uncalcified Tissue in the Enamel?" Fourth International Dental Congress, St. Louis, 1904. Vol. I.

THE COLOR PROBLEM IN PORCELAIN INLAYS.*

BY J. Q. BYRAM, D. D. S., INDIANAPOLIS, IND.

Color, for the purpose of this paper, may be defined as the quality of an object by virtue of which it reflects or transmits certain light rays and absorbs others. The specific effect produced upon the eye depends upon the character of the rays that reach the retina; a color examined in sunlight may appear somewhat different when it is observed by an artificial light, because such light is deficient in certain colored light rays.

Some of the phenomena of light, which assist in producing colors, are absorption, transmission and reflection. If a translucent body absorbs certain colored rays and transmits or reflects others, it will appear to be colored by a combination of the transmitted rays. This is commonly referred to as selective absorption, and the colors of stained glass, porcelain, etc., are examples of this phenomenon. Red pigments reflect or transmit red, yellow and orange rays, while they absorb violet, blue and green rays. Yellow pigments transmit or reflect red, orange, yellow and green and absorb blue and violet rays; while blue pigments transmit or reflect green, blue and violet rays, and the remaining rays, red, orange and yellow, are absorbed by these pigments.

If light penetrates a short distance into a body and is then reflected, its surface generally appears to have the color of the reflected rays. Light is not transmitted by an opaque substance, but the rays are either reflected or absorbed. When light is incident upon an opaque body, it is wholly excluded from the other side, being absorbed or reflected from the surface. Since cement forms an opaque body, it is this phenomenon that causes it to change the color of an inlay.

The pigments most commonly used in the manufacture of dental porcelains are precipitated gold and platinum, purple of Cassius, and the oxides of gold, titanium, manganese, cobalt, iron, uranium, silver and zinc. The colors produced by the use of these pigments in varying proportions are red, yellow, blue, green, brown and gray. Red is not used extensively by inlay workers. All gum enamel frits are tints of red. It may be used in the manufacture of browns and grays, also to build the gingival portion of many inlays.

---

*Read before the Minnesota State Dental Association, June, 1905.

Yellows: Yellow is the most important color for the porcelain worker. It is used to form the body of most inlays; it adds brilliancy to the browns or grays when combined with them. Yellows of a greenish hue tend to lose their luminosity in yellow light. Two yellows, in their deeper tones, may match each other perfectly, but when diluted to give lighter tints, may differ quite widely. One may be of a greenish hue, while the other may tend toward a grayish.

Blues: This color is used to build the body of the incisal or occlusal portion of inlays for those teeth with blue incisal edges or cusps. There is a variation in tone from greenish blues to those of a reddish hue. Blues of a greenish hue appear to be more translucent.

Other Colors: Green is seldom used alone; it may be added to blue to increase its translucency. Browns are used to build the gingival portion of some inlays and for the body of inlays for discolored teeth with a brownish hue. They may be added to yellows to sadden them. Grays are used to build the middle and incisal or occlusal portion of many inlays. They are also used to tone yellows and blues.

The intensity of a color is partially governed by the thickness of the mass. Two or more shades of a color can be made of the same porcelain by varying the thickness of the body. This fact is important in the application of colors. For after a color has been applied and fused, it is often found to be changed. The trouble arises from this: The layer of porcelain enamel is so thin that it is highly translucent and the underlying colors are reflected through it.

A study of the colors of the teeth should be made before the porcelain for the inlay is selected. While the pigments of the tooth determine its color to a large degree, the thickness of the dentine and enamel and the density of these tissues, with their power to absorb, transmit and reflect light, are also factors. The colors of most teeth containing no foreign pigments are brown, yellow, blue and gray with a yellowish or bluish hue. Normal dentine is some shades of yellow, while the enamel contains a variety of colors.

The variation of color so often noticeable when an inlay is cemented into its place is quite perplexing. The inlay may be a good match when the incident of light is at such an angle as will permit of its transmission. But when the angle of incidence is changed, some portion of the inlay may appear a different color. The cement is also a factor in this phase of the color problem. If it were transparent it would not prevent the passage of light through the tooth. But when light is incident upon a tooth containing an inlay, it is partially excluded from the dentine on account of the layer of cement, and the color of that part of the tooth and inlay which is in contact with the cement may differ from the other parts because of the unequal absorption and reflection of the rays. Moreover, a "shadow" is formed when an inlay is cemented into a cavity with a cement which dimly reflects and partially absorbs the transmitted rays, if the incidence of light is at such an angle that the unabsorbed rays can not be transmitted.

One of the phases of inlay work which always will be perplexing is the difficulty in obtaining colors that accurately match the natural teeth. When we consider that a tooth is composed of both organic and inorganic materials, with a variation of the density of these substances, and colored with pigments peculiar to it, we can readily understand how difficult it is to match tooth structure with a substance, inorganic in composition, differing in density, and colored with different pigments. Still, with the improved porcelains of today we may accomplish results with which we may justly feel a considerable degree of satisfaction.

There is a difference of opinion regarding the application of porcelain for inlays. In dentistry, as in other professions, it is hardly to be expected that all should accomplish the same end by the use of the same means. While, however, in this matter of inlay work, we are all striving for the same result, namely, a serviceable esthetic filling that accurately replaces the lost tooth structure. There are different methods of applying the colors in the construction of an inlay. Some build their inlays in layers, some prefer to mix the colors, while still others prefer to construct them by lightening the porcelain to counterbalance the change of color caused by the cement and to color the cement with pigments to approximate the color of the tooth. The method of lightening the porcelain may have some advantages, but it is open to criticism. It may be advantageously applied to labial cavities, for the angle of incidence is always such that the rays are feebly reflected and partially absorbed by the cement. It seems hardly possible to construct inlays for proximo-incisal cavities, requiring two or more colors, by lightening the porcelain and coloring the cement to match the different colors of the tooth. The sameness of color in these large inlays is also objectionable.

To Dr. W. T. Reeves belongs the credit of suggesting a method of building inlays in layers. His method is to bake a foundation layer or body to correspond to the dentine and then to apply enamels in different parts to correspond to the color of the tooth. He says: "Each color put on must be baked by itself. If you attempt to lay one color on another and bake at one baking it will result in the mixture of colors; while if baked separately each will preserve its identity. Put your colors on strong enough that when covering with what might be called an enamel layer, it will allow the colors to reflect through the enamel layer, modifying and harmonizing the colors. Dr. Reeves claims for this method a more translucent inlay, avoidance of shadow and preventing the cement's reflecting from beneath. While this method of constructing inlays may assist in overcoming these difficulties, it does not wholly remove them. This method obviates the necessity of lightening the porcelain and adding pigments to the cement. It also breaks the uniformity of color so often noticeable in inlays constructed of a monochromatic porcelain.

There are conditions under which I deem it advisable to mix colors in the construction of inlays. The yellows may need to be toned with grays; the grays to be brightened by the addition of yellow. Or the blues may be brightened by the admixture of green, or saddened by the addition of gray. I would not have you infer that I construct most of my inlays by mixing colors. However, I find that, in many cases, the mixing of colors gives better results than I can obtain by applying the colors in layers. The change of color in an inlay, caused by the cement's absorbing and reflecting the light rays, will be noticeable whether the inlay is constructed of a monochromatic porcelain, by mixing the colors, or by applying the colors in layers.

Mr. Robert Brewster has produced a white opaque porcelain for lining matrices. It is of a bright, reflecting character and dense enough to assist in counteracting the effect of the cement's absorbing the light rays. He says of it: "The matrix lining, as I have called it, promises to be a solution of a very vexing problem, the change of color in inlays caused by the cement. It is for the profession, however, to decide its efficiency by using it in various positions in the mouth and especially those that prove most trying as regards shadows. Building inlays upon a white base also has other advantages. It simplifies the procedure of color selection and obviates guess work. If desired, this body may be used entirely as a foundation body and the enamel body laid directly over it with the intervention of a yellow foundation. In any case, it should be used, wherever possible, of sufficient thickness to insure a full measure of opacity and be brought to a high glaze." I have used this lining to good advantage in many cases, but I have been disappointed in the results obtained with it in others. It requires considerable experience to apply the colors over this white opaque lining in such manner as to produce a proper color effect. If the enamels are applied in thin layers over this lining, darker colors should be used to prevent the lightening of the colors of the enamel by the lining. Care must be exercised to prevent the lining coming too near the margins or the colors along the margins will be lighter.

I believe the method of constructing inlays of two bodies differing in fusibility to be the correct one. The foundation body can be thoroughly fused, and when the enamel colors are placed in their respective locations and fused, the two porcelains give a more natural combination of color than can be produced by a single body.

Many porcelain workers prefer to apply each layer of enamel and thoroughly fuse the porcelain before the next layer is applied. But I prefer to apply each layer and fuse to a high biscuit, only heating the porcelain to the point of glazing at the final fusing. If a layer of porcelain is fused and then another layer of the same material is added and thoroughly fused, the first layer will be slightly over-fused. Hence, in the process of applying porcelain in layers and fusing each layer, the underlying layers will be slightly over-fused and somewhat lighter in color.

In the selection of colors for an inlay note the variations in color of the natural tooth. There are usually three or more colors, or shades of colors, in a tooth. The foundation of an inlay, representing the dentine, should be yellow (presuming that the tooth is vital), and the overlying colors should approach the color of the enamel in their respective positions. If the matrix lining is to be used, a thick layer should cover the matrix to within about one-half millimeter of the margin and be fused to a high glaze. The foundation body should be applied over the white porcelain and be contoured to replace the dentine. It should be fused, provided it is of a higher fusing porcelain than that used to replace enamel. Care should be taken to prevent porcelain of different colors from mixing when applying them to their respective position. If the colors are applied separately and biscuited, then a uniform color is applied over the entire mass and properly fused; the colors will be true and the fused porcelain will approach more nearly the natural tooth structure in appearance.

The uniformity of color in porcelain is dependent upon the accuracy of the fusing. It is difficult to fuse porcelain at a definite degree of heat without some means of measuring the degree of heat used. Many otherwise good inlays are spoiled in the furnace. Then, too, variations of the heat of the muffle will cause differences in the shade and the strength of the porcelain. Under-fused porcelain is of a duller hue and is less translucent, while over-fused porcelain is lighter and has more of a glass-like appearance.

Because of the opacity of low fusing porcelain it is impossible to construct inlays of this material for teeth of extreme translucency that will match as well as inlays constructed of high fusing porcelain. But the low fusing porcelain more nearly imitates the color of the natural teeth in cavities on the labial surfaces, because the opaque porcelains absorb and reflect light from the surface, thus causing less change by the cement.

In conclusion permit me to say that many dentists criticise porcelain inlays because it is possible to detect them. While the ideal inlay should replace the lost structure so accurately that it can not be detected, yet I fear it will be some time before we attain such perfection. Let us meet conditions as they really are, and strive to perfect ourselves in this branch of dental art, so that we may give to our patients filling which in a measure disguises the artificiality of our work.

ETHICS.*

BY ALFRED OWRE, MINNEAPOLIS.

I have chosen this subject for your consideration, first, because I am very much in love with it; second, because it is practiced more or less elusively; third, because it leads to a supreme or ultimate end.

Ethics simply defined is the science of conduct and is often called the moral code.

It is concerned with the consideration of the serviceableness of our conduct for some end at which we aim, and with the rules by which our conduct is to be directed in order that this end may be attained. It has set up standard laws and rules to an end; it teaches us to know as well as to do, hence it is a normative science; in other words, a science and an art.

In order to partially systematize this study Sidgwick has given the following summary view: The subject of ethics, most comprehensively understood, includes first, an investigation of the constituents of the good and well being of men considered individually, and the chief means of realizing these ends; second, an investigation of the principles and most important details of duty or the moral law; third, some inquiry into the nature and origin of the faculty by which duty is recognized, and more generally into the part taken by intellect in human action, and its relation to various kinds of desire and aversion; fourth, some examination of the question of human free will. It is also connected more or less with theology, politics, jurisprudence, psychology, etc., in so far as these subjects are concerned with the well being of the people.

However, I shall not attempt to follow any sequence, but rather to call attention to some defects, and offer in good faith a few thoughts leading to a possible better condition of affairs.

At the present time our lives are taken up with anxiety for personal security, with preparation for living or, in other words, with the accumulation of dollars. As a consequence of this seemingly chief aim, very little attention is given to principles, or the questions of right living or ultimate end at any time during life;

---

*Read before the Minnesota State Dental Association, June, 1905.

a direct result of this gross neglect is that men are only toned down by association and law. This is a slow process and not very permanent. It is paramount that any art or science must be cultivated more or less in order to reach perfection. Why should not ethics be taught from the very outset? Selfishness is so predominant in nearly all commercial pursuits, and we live in a commercial age, and man always assimilates something from the surroundings in which he lives. Therefore, the self preservation theory is more forcible than ever. Commercialism can not be classed as a high activity, and as always happens, the lower a human activity descends the further it recedes from what it should be, the more its self-assertion increases. A good life can be measured by the mathematical relation of love for self and love for others. The less there is of love for self the better the life. We can be happy in the happiness of others and content with having done all the good our means will permit. Life should be free and devoted to the end for which it is worthy—its own welfare and the welfare of others. This, then, might be termed the ultimate end, e. g., the well being of the people. This practically defines the moral law, the details of which need only to be worked out, and in this connection we can state that each science has been reduced to its lowest terms. In accordance with this statement, ethics has also been reduced to a question of utility and inherited experience.

True ethical science indicates to men their errors, and points to new unusual ways of life, both of which services are obnoxious to the ruling part of society, and rather than give ourselves the trouble of understanding these new duties we find it simpler and easier to ignore them altogether. It has been stated that love and religion are the basis of ethics, and this is certainly a good one, but perhaps a logical first step then would make the details more perspicuous. According to the teachings of Christ as propounded by Count Tolstoy, if a man's aspirations toward right living be serious it will inevitably follow one definite sequence, and that in this sequence the first virtue he will strive after will be temperance or self renunciation. And further in seeking to be temperate a man will inevitably follow one definite sequence, and in this sequence the first thing will be temperance in food. Apart from temperance no righteous life is imaginable. It must commence with a curbing of the passions, e. g., the first of the virtues, and work up. To sum up the details no better precept can be given than the old Confucian rule, "To do unto others as you would have others do unto you." This with humility were the chief doctrines of Christ, and were somewhat opposite to the high mindedness of the ethical spirit of the Grecians. I think we agree pretty generally that the practice of the Golden Rule is desirable, but that judgment should always be used in any action.

Therefore, it is advisable that each man should aim at making himself the most perfect possible instrument of reason, by cultivating both his natural faculties and his moral disposition.

Now, in order to make any law successful it must be equally binding upon both parties; right here is a stumbling block so far as the practical application of ethics is concerned. The rules of ethics must also be accepted, and then by means of a common power, that may use the strength and means of all, to enforce on all the observance of rules tending to the common good, which is really the supreme law.

I don't think we need any special system of ethics for dentists. We do need, however, more education and training, owing to the fact that the moral faculty is not innate, and, therefore, subject to the improvements we really desire. The more one knows the less he goes astray; the more informed men are the more they agree together.

From time immemorial members of the healing art have been generally looked up to and respected for their goodness, purity of thought and action, quiet manners and dignity in everything, and it is rather contrary to my ideal to associate them with any other character. We must take heed and not allow these hustling, selfish, modern, commercial attributes to stain our profession any further.

By purifying and rectifying our members we endeavor to correct also the whole human race; at least this is all the means in our power to counteract the evil that rules the world. If the laborious ants of commerce would stop just once and ask: "To what end?" and then as diligently seek the answer and live to that end, what an army of good people we would have in this world of ours. There has been a serious neglect somewhere, as so very few know anything about "Why we live."

This subject should be taught thoroughly in our homes and the preparatory schools. Since this is only partially done it behooves us to give more attention to it in the professional schools. Our men should be well read in the basal principles of ethics and right living, and then the making of dental laws, framing of reciprocity acts, etc., will not be so stupendous a task as it is at present. I realize full well the inaptness of men to change their habits as they advance in years. However, this is a serious proposition; let us arise and be more active in shaping the character of those who are to follow us. This is a field for conscientious labor, because many men have said: *"Had I but known."* In trying to put this subject before you I am fully aware that to live for a common good is a theory not practiced to a large extent by western nations. To realize an ideal in this respect is, perhaps, somewhat remote, and still I don't want to appear pessimistic in any sense of the word. Progress is always slow in beginning, but since the start has been made I should like to see the profession a little nearer the chrysalis stage before I step off. Can we not also receive some valuable suggestions along ethical thought from oriental civilization, especially Japan? Does not the common good of the people stand foremost with this nation, and is there not less selfishness? I think these questions can be answered in the affirmative, hence we are led to reflect a little upon the way we really are drifting. The professional schools are tainted with this selfish commercial spirit, and it does not tend to a common good. The wholesale enrollment and graduation is carried on in many cases for the purpose of increasing dividends on stock, regardless of qualification or fitness of the candidate, and also without considering the effect on the public. A reference to this is necessary, because unless we have men fitted for the place in this noble calling there will be no progress in ethics, as a full understanding of the eternal fitness of things seems to go hand in hand with ethical thought.

In conclusion let me say that whatever we do the whole dental profession, the whole human family should be the social unit and not the individual, as has been the case to a great extent in the past. And to do unto others as we would have them do unto us is as good a guide to our conduct today as it was centuries ago, if we will only accept it and use it.

ROACH'S NEW OPAQUE DENTAL PORCELAIN.*

BY E. J. PERRY, D. D. S., CHICAGO, ILL.

This porcelain differs from the porcelains in ordinary use in many important particulars. It is not my purpose to consider this substance from a chemical standpoint. We do not know enough about it to take up this phase of the subject. What the substance really is when it is baked, chemically speaking, or what its composition is, relatively, will form no part of this paper, further than to observe in passing that its component parts and its physical characteristics when baked entitled it to the distinction of porcelain. It is my purpose to draw your attention to its physical characteristics, its indications for use, and the technique of manipulation.

History.—About two years ago Dr. F. E. Roach conceived the idea that a porcelain inlay might be produced without the use of a matrix, either gold or platinum. The very great desirability of a porcelain body which could be mixed like plaster-of-paris, placed in the bare cavity or its model, permitted to set, then removed and baked, seemed to him possible of accomplishment. About this time he began his experiments, and tonight I have the pleasure of introducing through the Odontological Society to the dental profession Roach's new opaque dental porcelain. About eighteen months ago, in a discussion upon porcelain inlays, before the Chicago Dental Society, I predicted that the time would come when we would have a porcelain body which we could mold in the cavity or its model, remove when set, and bake, and no matrix would be used. It is with great pleasure that I can now say that my prophecy is realized.

Opaque dental porcelain is composed of foundation and enamel bodies and a liquid. The foundation body of which the bulk of the inlay is made fuses at a higher point than the enamel, and is not distorted by the heat in fusing the enamel. It works about like slow-setting phosphate of zinc. It should be well spatulated to a stiff mass, then worked in the hands, and introduced into the cavity or its model at about the consistency of dough. When set sufficiently hard it is removed, placed in a bed of silex, and baked. When returned to the cavity it will be observed to have shrunken, and no longer fits the model. It must here be noted that it shrinks on all its surfaces, the cavity surface as well as the outside. The inlay is now smeared with a thinner mix of the same foundation body, pressed into the cavity, the surplus trimmed off, and when set sufficiently hard the outside or exposed surface is enameled with whichever enamel the operator may select.

---

*Read before the Odontological Society of Chicago, December, 1905.

Now, as before, it is placed in the oven and brought to the fusing heat of the enamel. This result is a hard biscuit bake of the lining and a glaze of the enamel. When returned to the cavity this time it fits absolutely, not alone at the margins, but all over the cavity surface; there has been practically no shrinkage in the lining, as that comes with the higher heat. Yet this hard biscuit is sufficiently strong in this location to withstand any stress required of it. The inlay is now ready to set. No etching is required, as the cavity surface of the inlay has the distinct quality of uniting inseparably with the phosphate of zinc.

Experiments have shown that the phosphate of zinc unites, if not chemically, certainly with an adhesive strength many times greater than it does to the tooth itself or to etched porcelain. Physically, opaque porcelain is much stronger than the ordinary porcelain, being much less brittle.

Opaque porcelain is, on account of its opacity, limited to locations where not exposed to view, but most especially is it indicated in the molars and bicuspids, where the decay has progressed to a point where the operator has to decide whether he will crown or fill with amalgam. The latter alternative is but a postponement of the former. In large buccal cavities, in fact, any large cavity posterior to the cuspid tooth, also in large erosions, this porcelain is especially indicated. In Logan or Davis crowns, to secure a perfect adaptation to the root, in porcelain crowns of your own make for the same reason, as a base for an all-porcelain crown, molar or bicuspid, in fact its uses increase as one becomes familiar with it, and its limitations widen.

TECHNIQUE.—The cavity preparation does not differ from the same in ordinary inlay work. I prefer to use stones run in water. In my hands this is much less painful, and I can produce better surfaces than with burs. The cavity impression is taken with modeling compound, high fusing. A little care and a perfect impression can be had. You can also find out by this method if the compound is absolutely hard before you remove it, and it should be, if the cavity has any under-cuts. Should there be any, these should be leveled up with cement or the overhang cut away.

After the impression the next step is to get the bite. A larger piece of soft wax is placed between the teeth, the patient instructed to bite, the wax thoroughly chilled before removing. This is put away carefully to one side. Next we make the model of copper amalgam. It is usually safer to invest this impression in plaster, as by so doing it is impossible to distort it in packing in the amalgam. This may then be set to one side until the next day, when it may be separated with hot water, the wax bite placed in it, and an articulator of plaster made in the usual way. We are now ready to make the inlay.

We take the foundation body on a glass slab with a heavy spatula, mix well to a thick paste. Now work the paste well with the fingers to a dough; oil the model with olive oil and insert the mix in one piece, pressing it well into every part of the cavity. After a few moments, and before the porcelain sets hard, gently tease it loose. Now press gently back again. By being a little careful at this point there is little or no danger of the inlay sticking to the model. As soon as the mix begins to get brittle, it may be trimmed with a sharp spatula to the desired contour, cusps, and so forth. It may now be taken from the model; care, however, at this point must be taken not to fracture the margins, and should the inlay stick a little it must be pressed back into the model, and teased or jolted from place again. Now imbed the cavity surface of the inlay in powdered silex; place in the oven for a full fuse. As soon as baked it may be cooled quickly, and then dried in the model. We now have our inlay, minus lining on cavity surface, and the enamel on its exposed surface. We oil the model as before, make a thinner mix of the same foundation body well spatulated, but too thin to mix in the hand. With a smaller spatula place this on the cavity surface of the inlay, and firmly press into the oiled model. The surplus will squeeze out on all sides; after a few moments this surplus may be trimmed off flush with the cavity margin. When this mix is set it may be enameled in the cavity or held with a pair of pliers. In a few minutes we are again ready for the furnace. This time we bring the enamel to a full glaze, which makes a full biscuit bake of the lining. If we have been careful with our details, the inlay is ready to set, which, of course, does not differ from the same process in other inlay work. This porcelain is indicated in the use of Logan crowns, or Davis crowns, or any porcelain crown where no band or cope is used. Take a Logan crown after the root has been enlarged to receive the post, and the root end of the crown has been ground to fit as best you can What have you got? Only an indifferent adaptation to the end of the root, even in the best hands. At this point make a stiff mix, as for an inlay. Place around the post on the crown about as much of the porcelain as you would of cement were you to set it. Dry out the root, oil with olive oil, and press the crown into place. In a few moments tease it away carefully, and return it to place again. When partly set trim off surplus to the root margin, remove and bake to a hard biscuit.

Result: A perfect fit on the root end and a surface which will hold cement absolutely. If, before setting, you have roughened the root, the case, when set, is very strong, because of the adhesion at the root end. Davis crowns may be treated in a similar way, except that you must secure the platinum pin instead of the nickel one, commonly used. An all-porcelain molar or bicuspid may be made by cutting the root off nearly to the gum line, about as for a gold crown. Now cut in the pulp chamber a box-like cavity. The roots, of course, are filled and no post is used. Now select a porcelain tooth, a rubber tooth, a diatoric tooth, any porcelain tooth which answers the requirement as to shade, size, etc.; grind this to the occlusion; now mix your opaque porcelain as for an inlay; oil the root as before; place the mix on the root end of the crown and press to place. Two bakes will be necessary in most cases. This sort of crown excels any other form of crown under its indication for use.

This porcelain may be used as a lining for inlays made in the ordinary way. After the matrix has been burnished into the cavity or its model, place a lining of the foundation body No. 33 into the matrix, and allow it to set, not permitting it to come quite to the margin. This will, when set, hold your matrix from being distorted. Now proceed as usual. Result: The result will be a cavity surface to your inlay which will unite inseparably with the cementing media.

Another method which I have used is to finish the inlay, skin off the platinum foil, make a thinnish mix and place this upon the cavity side of the inlay; press into the model or cavity; trim off as before and bake to a hard biscuit. This result is a perfect-fitting inlay and a strong adhesion surface.

The advantages of this kind of inlay as a tooth-saver is all that are claimed for any porcelain: non-conductivity of heat, an absolute sealing of the cavity, greater strength, ease of manipulation, and its application many times less tedious for the patient. These undoubted qualities entitle it to a high place in our tooth-saving armament.

FROM A MICROBE'S POINT OF VIEW.*

BY C. EDMUND KELLS JR., D. D. S., NEW ORLEANS, LA.

In the practice of dentistry many cases present themselves in which the abnormal conditions lie deep seated and beyond the range of the human eye, nor can they be recognized by the sense of touch or otherwise, and therefore the operator must necessarily hazard an opinion based entirely upon previous experience. Here, while the best trained and most skillful dentist may be entirely "at sea" as to what events have transpired within the depths of the alveolar process, a little microbe may be away down there, who from his vantage ground, can readily see everything that is going on.

It is the purpose of this paper, therefore, to bring to your view tonight certain cases from personal practice which have been observed from a "Microbe's Point of View," and, having been studied from this standpoint, their treatment was transferred from the realm of uncertainty into that of exact knowledge.

When I realize what the Roentgen Ray allows us to see from this "Microbe's Point of View," and how practically indispensable it has become in our own practice, it is somewhat difficult to appreciate why its use has not grown to be more universal amongst the dental profession within the last few years.

---

*Read before the Chicago-Odontographic Society, December, 1905.

It is true that in the beginning the pioneers in the work had immense difficulties to contend against, but hours and weeks and years of incessant toil by hundreds of devoted investigators have overcome most of them, and today the work is made most easy to the beginner.

As an illustration of the great advance made in one direction only, that is, the point of time necessary for an exposure for a skiagraph, it is only necessary to state that with our original apparatus it required at least five minutes for that purpose, and then a much inferior result was obtained than is now gotten in three seconds.

In all other details of the art almost equal progress has been made, so that at this date an apparatus may be installed and its use learned with comparatively little experimental work upon the part of the operator.

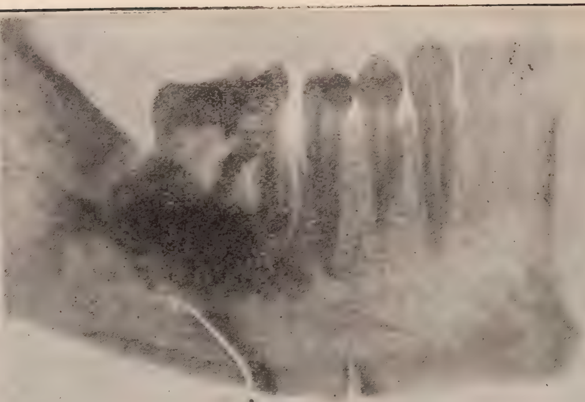
Having read a paper before the National Dental Association in 1900, giving a rather comprehensive history of Professor Roentgen's discovery and the technique of dental skiagraphy, it will be no part of this paper at this late day to repeat such details with which undoubtedly you are all more or less familiar, but, as before stated, your attention will be occupied solely by "cases from practice," trusting that the models and pictures will substantiate the claim that skiagraphy has undoubtedly become practically indispensable to us, and should be available to all progressive dentists.

In justice to myself, and others as well, who show lantern slides of untouched skiagraphs of the jaws of *living* subjects, I would say that it is a rather difficult matter to make them of all cases.

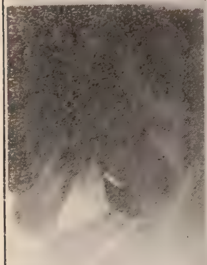
Many originals which show sufficiently well for all practical cases can not be satisfactorily reproduced for publishing or screen work, for in the process of making these reproductions the faint though nevertheless satisfactory differentiations of the various tissues are lost.

I will now throw upon the screen a picture of a dried bone which was most easy to produce, but such clearness in details can not be ordinarily obtained from the living subject. Figure No. 1.

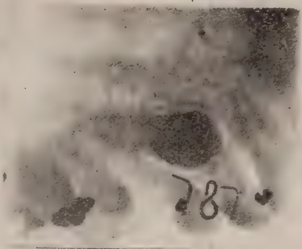
Many of my most interesting and satisfactory cases can not be shown for these reasons, as retouching them to meet the requirements of screen work would rob them of all practical value.



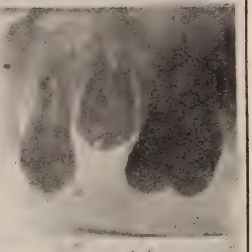
1



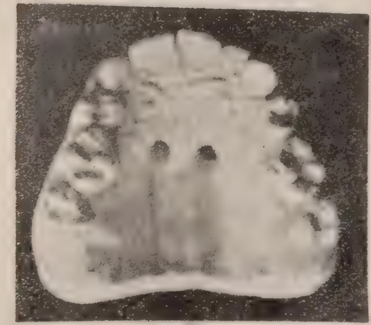
2



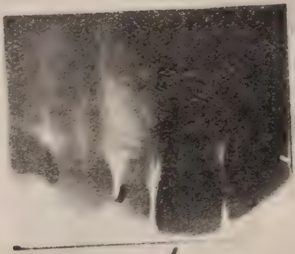
3



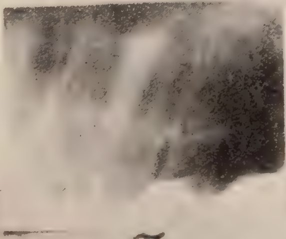
4



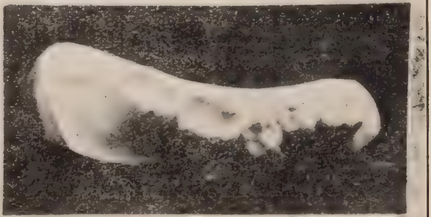
5



6



7



8

Figure 2 typically illustrates the advantages of the Roentgen Ray in precisely locating an unerupted tooth. Here the missing cuspid is clearly brought into view and the best course of treatment of the case may be rationally formulated.

The cuspids, more particularly the upper, appear to be most erratic teeth, as they are frequently not erupted, and are found in a great variety of positions within the alveolus, but I have yet to find a case where this tooth was not to be found somewhere within the jaw.

Figure 3 is another similar case.

Figure 4 shows a typical case of interlocked bicuspid, which condition is, of course, very commonly met with. When there is no sign of such a tooth within the mouth, and then, of course, there is always a possibility of its not being in the jaw, such a picture as this relieves the operator of all uneasiness in the matter.

Figure 5. Here is the upper model of a miss of twenty, from which we see the two bicuspids and two permanent laterals are not in the arch. Upon the right side the central and cuspid are in juxtaposition, while upon the left the temporary lateral still occupies its original position.

In this case the skiagraphs, Figures 6 and 7, are in great contrast to those previously shown upon the screen, as none of these permanent teeth are to be found within the jaw, and therefore the subsequent treatment was laid upon no haphazard lines.

It may be of interest to note that the lower jaw of this same patient showed no less than three bicuspids to be missing, and these also were shown by skiagraph to be absent from the jaw, thus making a total of seven teeth absent from her full complement.

In cases of impacted lower third molars, skiagraphy has offered me and my patients the greatest relief, and practically revolutionized my method of operating.

Figure 8 represents a model of a typical case in which there are no visible signs of the tooth in question, and Figure 9 is a skiagraph of the case.

Some time previous to taking this picture the niece of the patient had presented with a condition, as shown in Figure 10, upon the lower left side, and two years later, while there were still no signs of the unerupted molar upon the right side, its presence was suspected, and a skiagraph, Figure 11, was taken which was practically a duplicate of the first picture of the opposite side.

Three impacted molars in two members of the same family looked interesting, and as the latter patient had a younger brother, now seventeen years of age, I was interested to learn what "was doing" in the posterior portion of his lower jaw, and readily got his consent to take a skiagraph. The result is now upon the screen, in Figure 12, there being absolutely no vestige of the molar to be seen. While only one side is shown tonight, both lower teeth are missing, as shown by the various skiagraphs taken. Here, then, we have three people immediately connected, the one with one and the other with two impacted lower molars, while the third will have no lower third molar whatsoever.

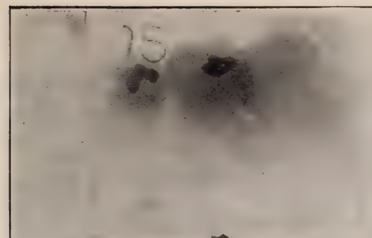
Thus many things of surpassing interest may be seen from a "Microbe's Point of View."

The case now to be shown is, I believe, the most unique on record, at least I have read of nothing to equal it, nor met with such a one previously.

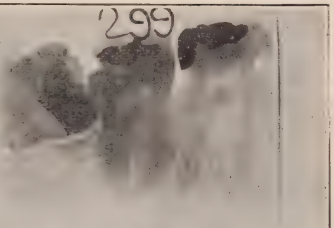
A little girl grew up under my care and unconsciously the non-eruption of the third molars was not noticed. Last summer I realized that they were past due and not in place as they should have been, and upon inquiry she stated that no one but myself had operated for her during the past fourteen years.

Looking up my books I found no extractions had been recorded. I therefore, according to rule, skiagraphed first one and then the other upper and lower and found all four molars deeply situated. Here, therefore, was found a most wonderful freak of nature—four impacted molars—and such impactions as they are—in the same jaw, as shown upon the screen, Figure 13. Note how deeply situated the upper molars are, and the lowers not only deeply placed but actually pointing in a downward direction. Up to this writing not the slightest inconvenience has been caused by these teeth, and the case will be watched in the future with the deepest interest. With such a slide before us, is it astonishing that the Roentgen Ray proves so fascinating?

Figure 14 is another striking example of what can be seen from a "Microbe's Point of View." Here the occlusal surface of the upper third molar was barely visible and the patient complained of much

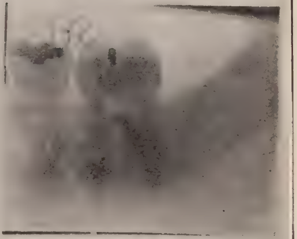


9

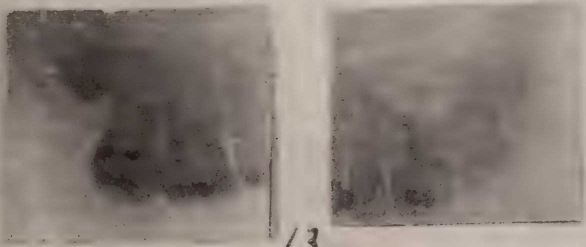


10

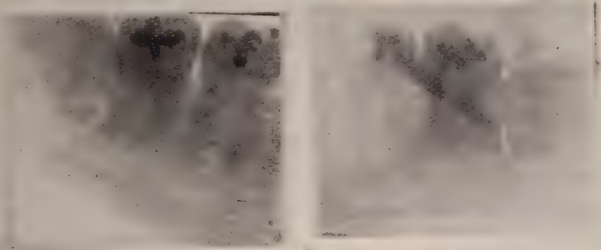
11



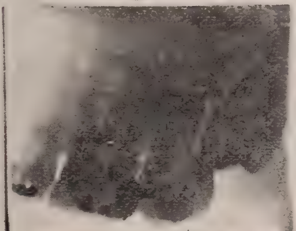
12



13



13



14

pain in that locality. No cause could be discovered for the trouble, and so a skiagraph came in its rational order. The skiagraph shows that such an enormous amount of absorption had taken place in the second molar that its extraction was deemed the best procedure, and this diagnosis was fully confirmed upon an examination of the extracted tooth.

The hard enamel of the third molar had burrowed its way into the roots of this tooth until its nerve had become fully exposed, which conditions were ample to have caused the suffering reported.

This completes the illustration of unerupted and missing teeth, and if the Roentgen Ray could be of no further service, I think such uses alone would entitle it to a place in our offices.

But far from its full value is the relieving of our minds upon such points only, for we will now take up a series of cases entirely different and yet frequently just as misleading.

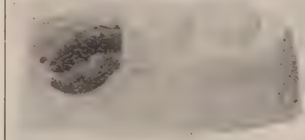
Figure 15. A stranger presented, complaining that eighteen months previously she had had a right lower third molar *extracted*, since which time she had suffered very considerably from time to time in that region. An examination showed a small fistula just behind the second molar. No time was wasted in futile exploration with probes, but a skiagraph taken and the cause of the trouble is to be seen deeply imbedded in the bony tissue, and with this picture in hand its removal was a comparatively easy task.

It will be noticed that the fragment of root which lay more or less horizontally, instead of normally perpendicular, is shown to be in a much more anterior position now than it held before its crown was excised. In other words, these roots have migrated in the line of their long axes, instead of erupting perpendicularly, which they were free to do.

Many years ago I read that the gum *never* closed over a fragment of a root which was broken off in extracting, but that a very close examination would always reveal a fistula leading to it. This statement particularly interested me, and I searched for years for a broken root completely covered by the gums and without the fistula, but always in vain.

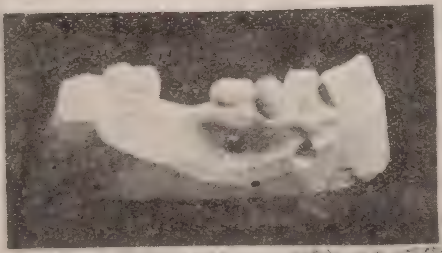
One day last summer a young lady came in from one of the parishes, and incidentally she remarked (as usual) that she had been "nearly killed" a few months previous when an attempt had been made to extract the first right lower molar, and that the dentist had failed to remove the entire root.

Figure 16 is a model of the case in question, and the gum between the second bicuspid and second molar was hard and firm, absolutely perfect and as healthy as could possibly be, so I merely

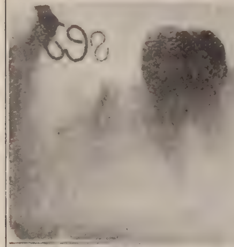


15

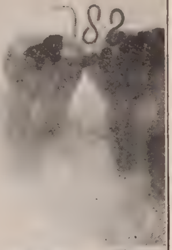
15



16



17



18

stated that she must be mistaken, as no fragment of a tooth could possibly be entirely covered by such healthy tissue, and as she demurred, I offered to prove my assertion by skiagraphing the case.

The skiagraph, Figure 17, shows that if I had previously seen the condition of things from a "Microbe's Point of View" I would not have so rashly made that assertion, for a good-sized fragment of root is surely there, as she stated.

Figure 18 is another of the same class. A small fragment is clearly shown in the picture, entirely surrounded by its bony nest, while no signs of its existence are to be seen in the mouth.

Here are shown typical causes of *"neuralgia,"* which is not uncommonly met with, and yet in which it is so difficult to reach the seat of the trouble, and here again does this series show that the Roentgen Ray is practically indispensable for correct diagnosis.

But its usefulness by no means ends with this set of pictures, for in other and fully as important cases are we practically helpless without first obtaining a picture from the "Microbe's Point of View."

A case in point: A gentleman called suffering from a first lower bicuspid which was very sore and contained a large defective filling.

Upon inquiry he stated that the root had been filled some five years previously, and that occasionally since then he had suffered from the tooth. According to rule, all such cases are immediately skiagraphed that no valuable time need be wasted, and the method of treatment is determined upon only after the conditions within the root and at its apex are learned.

In this case the conditions were such as shown in Figure 19. The root filling extended about one-half the length of the root, the lower half being absolutely devoid of any filling material whatever, and the empty canal can be clearly seen in the original skiagraph.

A pus pocket is also clearly shown at the end of the root and upon its mesial aspect. With such a picture in view treatment appeared simple, but upon removing the root filling such a quantity of pus and blood poured out that I feared an unexpected trouble was in store, and asked the patient if he remembered whether or not the dentist had used a drill in the root, he stated firmly that he distinctly remembered such to have been done. Thus my fears were strengthened, and it would only require another skiagraph to confirm my conclusion that the root had been drilled through. To determine this, a lead post was placed in position and a skiagraph taken with the result shown in Figure 20. The root had been drilled through and the lead post shows that fact clearly.

While the prognosis in such cases, I suppose it is safe to say, is usually unfavorable, the knowledge gained by skiagraphy allows us to save many such teeth that would otherwise be lost.

In this case by its aid the root was as usual rationally filled immediately, notwithstanding the presence of blood and pus at the end of the root. The abscess cleared up at once and in a few days the tooth was in normal condition.

Another such case: A gentleman presented, complaining of soreness in a right lower molar, which, according to his statement, had been under "treatment" for some six months or more. The "treatment" referred to consisted of placing a dressing in the root canal and sealing same, which would soon be followed by soreness and pain, whereupon the dressing would be removed and the tooth left open for a while, which "continuous performance" was repeated from time to time until the patient became tired of it and concluded to try other means.

Upon opening up the tooth, for it was tightly packed with cotton, blood and pus were found in quantity, and a bristle passed into the distal root canal caused pain and it was evident that the foramen was large and that abnormal conditions existed.

The usual lead post was placed in position and the skiagraph obtained is shown in Figure 21, and it speaks for itself.

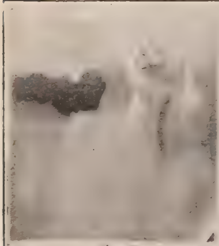
The roots were filled at once, of course, and notwithstanding the long seige of irritating treatment it had previously undergone, and the considerable absorption of the root, conditions changed immediately for the better, and, greatly to his surprise, the normal function of mastication was restored without delay.

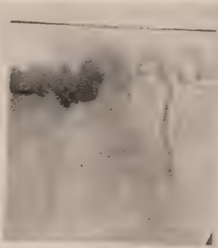
Skiagraphs and immediate root filling are certainly admirable companions in arms, though by no means do I intend to convey the impression that immediate root filling is dependent upon skiagraphy, for it is well known that the former was well tried out and adopted many years before the discovery of the Roentgen Ray.

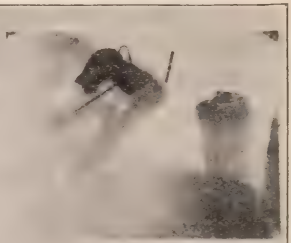
By this term, "immediate root filling," is meant, of course, the permanent filling of all roots of teeth immediately at the first sitting, notwithstanding the presence of blood and pus, either in so-called blind abscesses, or abscesses with fistulas.

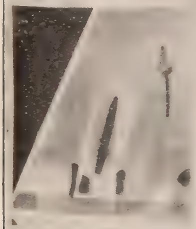
Figure 22 shows the conditions obtaining under a crown upon the abscessed root of a lateral incisor. The root is clearly shown to have been drilled right through its side, and, of course, the cause of the "trouble" is made apparent.

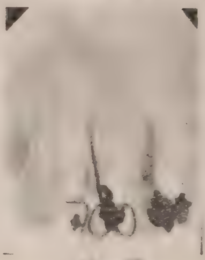
A lady called who had grown tired of having a lateral incisor "treated." Upon exploration it was apparent that the root was perforated. A lead post was put in and a skiagraph taken, as shown in Figure 23, which corroborates the diagnosis, and all doubt about the case was removed.

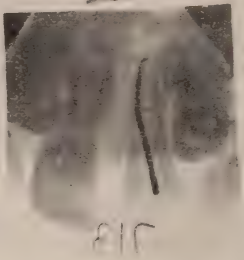

19

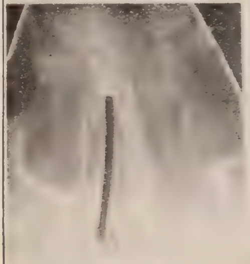

20

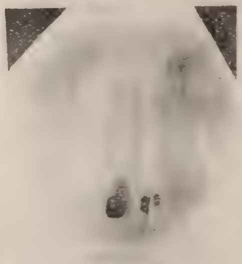

21

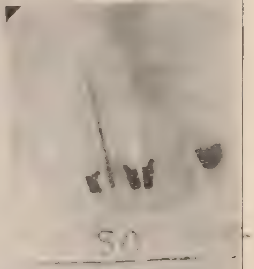

22


23


24


25


26



27

And right here it is opportune to say that in many cases drilling into roots for the purpose of inserting posts for crowns is most treacherous work. Where advisable, we drill a certain distance only, insert a post, and skiagraph and then we learn whether or not we are drilling in the right direction or are dangerously near the apex or side.

Again, whether or not a root is sufficiently strong to warrant crowning is sometimes a matter of doubt, and under these circumstances we naturally skiagraph the case, and upon the results shown do we base our conclusions.

By some oversight I have no slide of such cases with me tonight.

We are all occasionally called upon in those unfortunate cases where a child breaks a partially erupted permanent tooth, and appreciate the difficulty of satisfactorily closing the large foramen always found in such cases.

By the aid of the Roentgen Ray our method of procedure is as follows: A lead post is passed into the canal to what is supposed to be the apex of the root, bent over and a skiagraph taken, the result being as shown in Figure 24.

As here shown, the post penetrated considerably beyond the end of the root, and impinging upon the bone, was bent.

Noticing the amount protruding, another and larger post was trimmed to pass up the canal to the length determined by the first post to be correct, marked that its exact location could be determined, and another skiagraph taken. Figure 25.

As many skiagraphs with posts of varied lengths are taken as may be necessary, until finally the desired result is obtained, but the knowledge that the work is properly done and the tooth will be saved is ample compensation for all the work involved.

In April, 1899, at the age of nine, one of my little patients killed the pulp in a central by a fall and the root was filled in the manner just described, excepting that lead was not used for a filling material, but carbolized wood, which therefore does not show in the skiagraph.

Figure 26. The picture shown was taken six years later and depicts the conditions at the apex at this time.

After having filled the root canal of an incisor, it is quite reassuring to have one's doubts removed by a skiagraph, as shown in Figure 27.

And thus once more another series of cases proves most conclusively the inestimable value of obtaining the "Microbe's Point of View." And yet, this is not all it will do for us.

While there may not always be any practical benefit to be derived from skiagraphs of implanted and replanted roots, still as a matter of interest it is satisfactory to observe just the conditions that obtain there.

Figure 28 shows a lower first molar which was replanted on June 25, 1891, and the skiagraph, Figure 29, was taken on June 26, 1905, or fourteen years later, and at this day the tooth is still solid and doing good service.

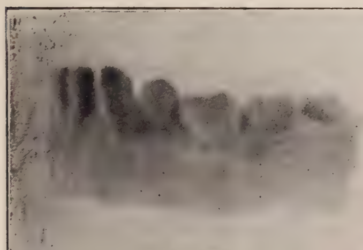
Figure 30 is the skiagraph of an upper first bicuspid which was replanted on November 2, 1896, the skiagraph taken on November 9, 1905, and after nine years of service the tooth is still as firm as ever. The dark spot is the shadow of the gold filling with which the apex was sealed.

Figure 31 is that of a lower bicuspid replanted on March 2, 1900. Skiagraph taken about three years later, and imagine my astonishment at discovering the true state of affairs, as the solidity of the crown led me to believe the root had not been absorbed. The gold screw with which the apex was closed is plainly discernible, apparently entirely free from its original surrounding cementum. Is it not strange that such a condition could obtain and no inflammation result?

Figure 32 illustrates a rather interesting case. The skiagraph shows the second bicuspid (still unerupted) to be defective in enamel formation and later on the eruption of the tooth corroborated the picture, as the enamel was not fully formed. The cast of this case is among my models.

In Figure 33 is shown one of the most extensive cases of blind abscesses, so-called, which ever came under my observation. The first molar was practically floating in pus, and, judging by the touch, had no bony attachment. A large pus area extended below the roots of the second molar. I would hardly like to give the history of this molar prior to my having seen it, for I fear my veracity might be doubted, but this was the condition it presented to me. I would state that this picture was taken seventeen months ago, and the tooth is still in position.

Figure 34. Some time ago a very prominent gentleman in one of the parishes was treated, but I do not know how, by his physician for a swelling in the region of the left lower jaw, and the case not healing, he advised him to come to New Orleans and consult a surgeon. Upon arriving in this city he consulted one of the leading surgeons and he was referred to me for possible dental trouble, although the belief was that it was a serious condition that would require surgical interference. The skiagraph was taken at once, of course, which shows a pus sack at the root of the second lower bicuspid, and



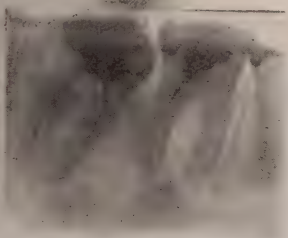
28

29

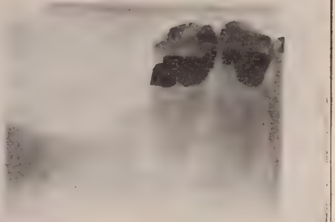
30

31

32



33



34

upon the filling of this tooth the swelling rapidly disappeared and the surgical operation was averted.

It is in order to say that this condition could not be diagnosed by any ordinary means, as the tooth gave no indication of its being affected.

With such practical demonstrations of the fund of absolute and most valuable knowledge to be obtained from the "Microbe's Point of View," the question naturally arises, are the dentists of Chicago—the men who are recognized to be the most progressive men in the profession—doing themselves and their patients full justice by utilizing the Roentgen Ray as much as it should be done? And, if not, why?

There are good and valid reasons why every dentist will probably never be an expert X-ray operator, but there is no reason why, in such a community as this, that its advantages should not be available to every member of the profession. While in all large cities we find hospitals and some special laboratories where the physician can send his patients and have satisfactory skiagraphs taken, these establishments, as a rule, are not capable of doing satisfactory dental work. I see no reason why the equipment of every dental college should not include a first-class Roentgen Ray apparatus, ready at any time with a competent operator to take skiagraphs for the profession at large, for the time is not coming, but has already come, when the better class of patients do expect, as is their right, that those to whom they entrust the care of their teeth shall avail hemselves of all known means for their preservation, and haphazard opinions are out of date upon all such cases wherein the operator can be fortified by the exact knowledge which can be obtained from a "Microbe's Point of View."

And now it would be incomplete to close this article without at least a reference to stereoscopic skiagraphy, which bears the same relation to ordinary skiagraphs as stereoscopic photographs do to plain camera work. While an ordinary skiagraph is a marvel, a stereoscopic skiagraph adds the greatest beauty to the supernatural picture. The most forceful and brilliant writer would fail to find words to do such creations justice. They must be seen, not glanced at, but studied carefully to bring out their thousand beauties. From the nature of the work it is impossible to reproduce such pictures upon the screen, but I have a number of plates for your examination, trusting they will prove of interest.

We must not forget that to the discovery by the modest German student, Professor Roentgen, is due the privilege of making these observations from "The Microbe's Point of View."

METHODS AND MEANS.*

BY H. E. DAVIS, D. D. S., ST. JOSEPH, ILL.

I have chosen as the title of my paper, "Methods and Means."

In what I have to say I am giving you methods and means found useful in a practice of several years, and giving them as if one of you had come to me in my office for such help.

I will first speak of a few things I have found of much value to me in my laboratory. The best liquid flux that I have ever used, which I compound myself and find it ever ready and faithful, is:

℞	Boracic acid.	
	Borax aa	℥ ss.
	Ammonia muriate	grs. XII.
	Pot. carb.	grs. V.
	Aqua dist. q. s.	℥ IV.

It will keep indefinitely and can be used on any metal for hard soldering. It should not be used, however, in connection with porcelain.

I have frequently found by having some dorrance alloy and pure copper handy, I have passed through the crisis of being without solder at a time it was most needed, and if you care to be saving you can manufacture your own solder cheaper than it can be purchased at the dental depot. The silver required in solder should be in every man's pocket, a ten-cent piece being sufficient, and as for gold, use clean scrap gold or get a $5 gold coin which contains from 125 to 127 grains.

---

*Read before the Champaign-Danville District Dental Society, February 6, 1906.

Dorrance alloy consists of pure silver one part, pure zinc two parts, pure copper three parts.

In making the alloy melt the silver and copper together and when in molten state push the zinc into it quickly, a small quantity at a time, and between times cover with borax.

The following is the formula for 18k. solder:

Coin gold	30 grs.
Dorrance alloy	4 grs.
Pure silver	3 grs.
Pure copper	3 grs.

The following is the formula for 14k. solder:

Coin gold	30 grs.
Dorrance alloy	10 grs.
Pure silver	3 grs.
Pure copper	3 grs.

The difference in the karat of solder desired is in the proportion of the alloy used, as the gold, silver and copper remains the same.

I do all my wax work on a piece of plate glass, size 10x17 inches, which I find to be an excellent assistant in many ways, one of which is, it helps to keep the surroundings clean, and to clean the glass simply heat it or scrape it.

For heating rubber for packing a case I use a common soap stone with a handle, such as can be found at any hardware store, commonly called a foot warmer, which can be cut to size you wish. They will hold heat much longer than is needed and can easily be cleaned with a piece of sandpaper.

Place a small quantity of sodium bicarbonate in your vulcanizer before using and you will be surprised how clean you can keep your flasks. They are readily and easily cleaned after such use, quite a difference from those found in most dental offices.

A pair of flask tongs will greatly aid in keeping the hands clean, at the same time one can handle the hot flasks to a better advantage.

I have found nothing that will clean the hands as quickly and thoroughly as cleansing paste. It not only cleans but imparts a fragrant odor to the hands, and I have never found it the least injurious.

In opening a tooth with putrescent pulp, where the odor is something terrible, just apply to the cavity a small pledget of cotton previously dipped in Terebene and the offensive odor will change to that of attar of roses. Terebene is an antiseptic liquid manufactured by P. D. & Co. An original bottle is sufficient for two or more dentists.

Tr. Lavender Comp., U. S. P., costs sixty cents per pound and may be diluted to make a gallon or more. A few drops of the diluted solution in your cuspidor will have pleasant effect on your patients.

A good, cheap disinfectant for your instruments or to whatever use you wish to apply it, is found in Lysol, which costs seventy cents per pound. It is a pure cresol product containing the highest percentage of cresylic acid in a soluble and free state. It is a permanent preparation, non-toxic, makes a clear solution in water, is superior to carbolic acid and creolin as a bactericide and is less poisonous than either. A 2 per cent solution is equal to a 5 per cent solution of carbolic acid crystals. Lysol is suitable for general disinfection as well as for medicinal uses. For treatment of wounds a 1 to 2 per cent solution, for internal washing ½ per cent solutions are recommended.

For a convenient, pleasant and cheap mouth wash, add one of Dr. Seiler's compressed antiseptic tablets to a glass of water, which soon dissolves.

Before operating on an aesthetic patient eat Enthymol Tablets, manufactured by P. D. & Co. They are antiseptic and deodorant, and are not only good for a bad breath, but can be used for sour stomach and to relieve that full feeling after dining well.

In prosthetic work, when your patient has a tender palate and is bothered with retching, to stay such trouble while taking an impression, paint on palate a 20 per cent solution of bromide of potassium with a camel's hair brush, or gargle 5 to 15 grs., or both. In extreme cases give 10 grs. at night, repeat after breakfast and again, one-half hour before impression is taken, give 10 to 15 grs. It greatly diminishes the sensibility of a tender palate.

The following is my solution of the painless extraction of teeth:

℞	Cocaine hyd.	grs. X
	Carbolic acid (cryst.).	
	Gum Camphor.	
	Chloral hydrate aa.	grs. III.
	Aqua dist., q. s.	℥ IV.

Subscription—Rub camphor and chloral together until liquefied; add acid, cocaine and, lastly, water, and filter. Signature—For painless extraction. I have had it compounded a great many times at 25 cents for IV ℥. Compare the price with your $1.00 an ounce solution and compare it in any other way, for it will bear comparison. I compound my own solution and thus vouch for its accuracy. It takes effect immediately and I have my first case to hear from where sloughing followed its administration.

In making examinations I always allow my patients to have the hand mirror. Let them see for themselves all the conditions as found in the mouth. With the help of my mouth mirror I show them just the conditions and often find them greatly surprised. If you do this they will never say you made cavities in their teeth to fill.

Cover your bracket table with Red Cross aseptic paper covers, which are sterilized. They are not only neat and clean but make a favorable impression on your patient. Both sides may be used, which makes the cost insignificant.

After removal of the rubber cloth, have ready a glass of warm water with which to rinse the mouth.

I would like to urge the extravagance of clean linen. You can not use too much. I have been in offices and seen the same towel used on several patients. Again, I have seen the private towel of the operator used until a dish rag would look well by the side of it.

You will hear of many new drugs and appliances. If you have spare time look into these things. Try the drugs and think some of these little points out for yourself.

I use the chart or card system of keeping accounts, which is superior to that of a ledger. The cards are alphabetically arranged and divided into three divisions. The first are "unfinished," which contain uncompleted work and credit for any money paid before the operations are completed. The second are "finished," which contain all accounts when operations are completed and unpaid, and the third division, labeled "completed," contains closed accounts when operations are completed and paid.

Yon no doubt have patients call with the statement: "Doctor, the filling you put in has come out." The patient is only half convinced when you say the filling in question was not inserted by you.

If you have a record, you can turn to your index file and instantly take out the card, explain the diagram showing old fillings and the ones you inserted, just what you did, what method and means you employed, fees, etc. That patient will feel secure in the belief that what you say is so. This system of keeping records is business-like, and not only this, but it protects you from unscrupulous persons. The advantages of this system are many: First, I can find instantly any account or record, which can not be done if two or more ledgers have been used. Second, each filling is diagramed and is a protection to the dentist in two ways. It enables him to distinguish his own work and it prevents him from having to replace another's work. I think the principal advantage is that if the records are well kept they must be posted after each operation.

Regarding collections, I have had so little experience I have little to say. I make no bad accounts and have nothing to collect.

The following poem, taken from the *Alkaloidal Clinic,* I believe will be of interest to some of you:

THE DOCTOR'S DREAM.

Last evening I was talking
  With a dentist, aged and gray,
Who told me of a dream he had—
  I think 'twas Christmas day.
While snoozing in his office,
  The vision came to view,
For he saw an angel enter,
  Dressed in garments white and new.

Said the angel: "I'm from Heaven,
  The Lord just sent me down
To bring you up to glory
  And put on your golden crown.
You've been a friend to everyone,
  And worked hard night and day,
You've doctored many thousands
  And from few received your pay.

"So we want you up in glory,
  For you have labored hard,

And the good Lord is preparing
  Your eternal just reward."
Then the angel and the doctor
  Started up toward Glory's gate,
But when passing close to hades
  The angel murmured, "Wait;

"I have here a place to show you,
  It's the hottest place in hell,
Where the ones who never paid you
  In torment always dwell."
And behold the doctor saw there
  His old patients by the score,
And grabbing up a chair and fan,
  He wished for nothing more.

But was bound to sit and watch them,
  As they'd sizzle, squirm and burn;
And his eyes would rest on debtors
  Whichever way they'd turn.
Said the angel, "Come on, doctor;
  There the pearly gates I see,"
But the doctor only muttered:
  "This is Heaven enough for me."

He refused to go on further,
  But preferred to sit and gaze
At the crowd of rank old deadheads,
  As they lay there in a blaze.
Just then the doctor's office clock
  Cuckooed the hour of seven,
And he awoke to find himself
  In neither hell nor heaven.

If you will pardon me for a little of my own experience I will relate one instance which will give you an idea of how I arrange for new patients.

Recently I received a letter from a man in a nearby town (I will not say how many dentists are located there), wanting to make an engagement with me, saying he had a good deal of dental work to be done. I went to my banker, who telephoned to this town and made inquiry regarding him. The information received being satisfactory, I made an appointment. Had it been otherwise, I certainly would have been engaged for the time mentioned. I reasoned that something was wrong, and I preferred thinking that the wrong was with him rather than his dentist. I will not work for a person who can not get such work done at home, if they wish to. I thought of him as a headbeat, who owed his dentist and was now trying to work me.

Upon his arrival I learned that a friend of his, who was also a friend of mine, had spoken highly of me, and upon that recommendation he had come to me. I then felt more secure regarding him and also felt that I had taken the better course, for I would much rather remain idle than work and receive no compensation, or have trouble in getting it.

Sometimes I am asked: "Do you guarantee your work?" This is a question, however, I am glad to say, I do not have to answer very often, and when I do I reply: "As near as I can say, I am located here permanently and in each operation I try to do my best, but if anything should go wrong I should like to hear of it." Sometimes I ask them if they demand as much of their physician or of their dressmaker or tailor, as the case may be, and I generally make it as embarrassing for them as they had made it for me.

It can not be too strongly insisted upon that the very best we can do should be at the disposal of our patients. Another has said: "A patient comes to the dentist ignorant of his art, desiring that he should do the very best and it is the dentist's duty so to do. The fact that a dentist is practicing means that he is offering his services upon these conditions, and anything short of it is malpractice." It is our duty to master our profession, not that we may make money only, but that we may be of service to mankind, which is the most honorable of all work.

The question of fees is always a difficult one to write upon, but it can not be too strongly insisted upon that we are not selling materials, whether mechanical or operative. I know a dentist who, after inserting a gold filling and upon being asked the charges, said: "The gold I have put in amounts to 75 cents and my work is worth about

$1.00, and that will make $1.75. Whatever fee you may choose to name should be for your skill and experience, and the idea that when the sum named is more than the patient can afford an inferior article may be substituted, should be forever abolished from our system. Better send them to some junior practitioner.

The same laws should govern our calling that are found among physicians. The physician does his best, whether he takes a large or small fee, and if he considers his services of more value than the small fee offered, he refuses to take the case and recommends some junior practitioner. There is an abundance of work to be done. Let the beginner increase his fees as his practice grows, and if he is able and conscientious he will have no cause, as the years advance, to fear cheap competition. The limit of what a man can successfully demand is the limit of what he is worth, and dental codes can not raise his standard of excellence. The demand for his services fixes his fees, and if he has not, at the expiration of, say, ten years, been able to collect about him such a number of loyal patients as shall make him fearless of cut-rate workers, he has only himself to blame.

My excuse for using the personal pronoun "I," that has occurred so frequently in this paper, is, I know my own methods and means better than I know the methods and means of any other dentist, and consequently preferred to talk about my own experiences.

Gentlemen, I thank you for your kind attention and hope that even if to some of you I have imparted nothing new, what I have said will refresh your memories and perhaps serve to spur you on to better results in the future.

PROCEEDINGS OF SOCIETIES.

THE MINNESOTA STATE DENTAL ASSOCIATION.

DISCUSSION OF DR. BYRAM'S PAPER, "THE COLOR PROBLEM IN PORCELAIN INLAYS."

Dr. Arthur E. Peck:

I believe that I voice the sentiments of the society when I congratulate ourselves upon obtaining the efforts of so able a man as Dr. Byram. He certainly has given us one of the best papers which it has ever been my privilege to listen to or read. His ideas coincide so perfectly with mine that it is difficult for me to open a discussion which will bring out an argument sufficient to be of much interest, as it would necessitate my opposing well established facts. However, there are a few minor points on which I differ slightly, the importance of which I should like to impress upon you.

In the doctor's paper he mentioned that the intensity of color is governed by the thickness of the mass. This is a point which I should like to emphasize, and I would suggest that when matching the shade to have the sample which you use as near the thickness of the tooth at the point which you are matching as possible. The change in color of the tooth as it approaches the gingival border is due almost entirely to the body of dentine lying beneath it. Therefore, the method he has stated of choosing the enamel and then the dentine and endeavoring to replace them in their relative positions in the inlay will come the nearest to producing the desired shade.

The mixing of colors to obtain a blend in the inlay is getting on very indefinite ground. It lies within the scope of a very limited few to be able to take a little of the foundation color and add it to one of the other shades to reproduce any desired color. It is a much quicker and more exact method to mix the shades, taking a portion of any two or more bottles and thoroughly macerate and blend them by passing through screens, and placing this body in a bottle, to then bake a portion of it into a button. This button would give you the exact shade of the powder in the bottle. With this sample shade you can match the color wished and be sure of reproducing it. This method will give you an unlimited number of colors from which to choose the shade desired, but to mix different colors to match a certain shade possesses an element of uncertainty which only a few can overcome.

Dr. Byram also refers to a white opaque porcelain for lining matrices. I have experimented with this somewhat and can see no advantage in its use. There are many things given to the profession because of the remuneration which they will necessarily bring to the manufacturer, and it seems to me that it is our duty at these meetings to endeavor to eliminate many of the unnecessary appliances and materials. The layer of cement which rests between the inlay and the tooth is an opaque substance, and I can see no special advantage in placing another layer of the same nature between this and the periphery. This would only double our trouble as it is admitted by all inlay experts that a transparent cement would enable us to match our inlays much more perfectly than we are now able to do, which means that the opaque substance, which is the cement, is the cause of most of our troubles; and to then add another layer of the opaque material is certainly adding difficulty to an already difficult problem.

Dr. Byram also stated that it is his method of constructing inlays of two bodies having different degrees of fusibility. This does not seem necessary, as a pyrometer furnace will allow each succeeding layer to be fused a few degrees lower than the preceding layer. Of course, this rule applies only to those who believe that the first layer should be fused to the highest degree. By this I mean to give the high glaze to the first layer, and to the last layer I aim to give only a velvet gloss; this insures a perfect retention of the color. This point is the one which I think is of great importance as it is only a slight step from a high glaze of most any porcelain to a slight change in its color.

The doctor says that uniformity of color depends on the accuracy of its fusing. Why take the chances of bringing the inlay to a high glaze at the last bake, when you can be perfectly assured of the correct color by obtaining just a velvet gloss and thus add much greater strength to the porcelain?

I consider that the importance of using either the high or low fusing bodies depends entirely upon which porcelain offers you the desired shade. For those who use the pyrometer furnace I believe that it is just as easy to obtain the exact shade with the low fusing bodies as with the high. But without the pyrometer I should confine myself almost exclusively to the high fusing bodies. In my practice I use them both in about the same proportion, using the shade of whichever porcelain suits the case. I trust that I have deviated enough from this interesting and practical paper to open up a good discussion, as I believe it one of the most important branches of porcelain inlay work, and think it should be well discussed before passing.

Dr. W. N. Murray (Minneapolis):

This paper is certainly one of great interest and candor, and this society is to be congratulated in having a man of the experience of Dr. Byram to appear before us.

This subject is of special interest to me, as I have made considerable investigation in the porcelain art. It is a question with me whether the baking of porcelain in layers is of any consequence from a scientific standpoint. It is certainly a beautiful theory, and as such, in my estimation, is only worthy of consideration. The fact is that any of the cements give us all of the dark colored dentine that we desire, and more than we bargain for in most cases, and completely upset any sicentific theories that we may believe in regard to the baking of our inlay in layers.

There is also another difficulty in the color problem. That is the fact that we are looking at our inlays into the oral cavity, a dark background. This alone is a discouraging feature in the study of the color problem in porcelain, and almost completely destroys any translucency that our inlay may possess. I fully expect to be severely criticised for making these statements, but I think there is more truth than poetry in my statements.

Dr. J. O. Wells (Minneapolis):

I do not think I can add anything to the paper or the discussion. The subject has been pretty thoroughly handled, this being one of the most scientific papers I have had the pleasure of hearing on the color problem.

There are one or two points, however, where my experience does not quite coincide with the ideas set forth in the paper. For instance, I have not found it unsatisfactory to bake at one time two or more colors applied in layers. As a matter of fact, I very frequently do this.

Again, I find it very desirable in some cases to construct the inlay of a lighter colored material than seems to be in the tooth.

There are one or two practical points that have not been brought out that I will mention. When we are studying a tooth for the purpose of selecting shades, the patient should be in an upright position. I have noticed that if the patient is reclined so that the light strikes at an angle the teeth seem much lighter than they really are. This study should be made early in the operation before the teeth have been allowed to dry, as this always bleaches.

Again, in handling the shade guide we should remember that the body in the inlay will be much thinner than the specimen in the guide, and consequently much lighter, hence a darker color should be selected than is desired in the inlay.

DISCUSSION OF DR. OWRE'S PAPER ON "ETHICS."

Dr. J. O. Wells (Minneapolis):

The chair does not concur in the opinion that this paper does not admit of discussion and that an attempt to do so would be discourteous to the author. To the contrary, I believe much good could be done by a liberal discussion of the subject.

Dr. Forrest H. Orton:

I do not know much about this subject of ethics. I am ashamed to say that I have given more thought to the laws which govern self-preservation or the struggle for existence. The subject of ethics, as usually treated before a dental society, is mostly confined to our conduct toward our competitor. Dr. Owre has covered a very broad field and the outlines or principles which he has suggested are the result of years of study and contemplation of the proper conduct of life, and I thought as he read his paper if there were enough men like him in mentality and disposition we would have the millenium right here now.

Darwin says: "Man is the product of evolution," and there have been times when I thought that some of us could only lay claim to belonging to the Genus Homo because—well, because he stood erect or his incisor teeth are (sometimes) vertical. Early education of our parents, as well as ourselves, would undoubtedly do much to overcome this tendency to moral atavism.

The ethics of commerce is, according to the law of evolution, in which everything is for the strongest, and he who has the most takes the rest, and at the risk of being considered pessimistic I claim that with the exception of the professions and some of the noble arts, ethics has, and is, a lost art.

This subject has been touched on by most of the philosophers from Confucius to Emerson. They have all taught as the first or fundamental principle the observance of the golden rule, and considering that the human being inherits to a marked degree the social instinct and a desire for the approbation of his fellowman, the question arises, "What is the reason?" It is so sparingly observed it may be as the essayist has said, "Our moral faculty is not innate."

I think President Roosevelt is preaching very practical ethics in which every man shall have the fairest opportunity in this life's struggle.

CHICAGO ODONTOLOGICAL SOCIETY.

A regular meeting of the Chicago Odontological Society was held at the Wellington hotel on Tuesday evening, December 12, 1905, at 8 p. m.

Dr. J. E. Hinkins, the president, occupied the chair.

Dr. E. J. Perry read a paper entitled "Roach's New Opaque Porcelain."

DISCUSSION.

DR. W. H. TAGGART:

Mr. President—It is with a great deal of pleasure that I listened to this paper, and I wish to explain to the visiting dentists that in Chicago we are not having a real good time unless we are having a scrap, and at the outset I will state that I do not believe all that Dr. Perry has said. I will challenge a few of his points later, but prior to doing so, wish to refer to the advantage that I hope will come from a porcelain filling of this nature. There is no doubt that it is one way to make a porcelain filling, but to say that it is the only way to make it fit is, I think, putting it a little too strong. If the models passed around are the highest possibilities of the Roach porcelain I can not imagine that it will be a brilliant success, because I can not conceive of anyone saying that those are good fits.

There is no doubt in my mind that eventually Dr. Roach will succeed. The color problem is already solved. There is no color to it in the sense that we speak of it as porcelain filling. The cement can not improve it or make it any worse in color. This is in its infancy, and there is no doubt that in time we may get colors that are more ideal for porcelain fillings.

Dr. Perry refers to the point that with the matrix you fit the edges last and are not certain but that shrinkage has taken place inside the cavity. I think that is something of a mistake, because I know that if you take a well constructed porcelain filling, and if for any reason you have occasion to grind into the tooth, you will find a good fit all the way through that cavity.

I can not recall all the things that Dr. Perry said that I should like to challenge, but I do say that I hope what Dr. Roach has given to us will be a very brilliant success in the future.

DR. GEO. A. BOWMAN (St. Louis, Mo.):

Of all the subjects I am not familiar with, this is one. However, I do feel that it is a step in advance, especially that part of this subject which relates to the adhesion, the security of inlays in the teeth. Dr. Taggart refers to the color and I would say that while it is an advantage to have as brilliant an effect in color in the second molar as in the front teeth, yet I can say that if all the things that Dr. Perry has stated are true of this porcelain it will be very useful in the bicuspids and molars. I have seen fits that Dr. Roach made in my suburb only two weeks ago, and it was very beautiful work.

I will not take up your time further, as there are so many here who are better qualified to discuss this question than I am.

DR. WALTER N. MURRAY (Minneapolis, Minn.):

This has certainly been a very interesting subject to me. I was somewhat amused at the expression of Dr. Perry in saying that he would "skin off the matrix." I know that you gentlemen in Chicago have got us all "skun."

I am very much interested in this subject and in the substance that has been shown to us, and I know that with the ability that exists in the city of Chicago something will come of it, and I believe it will be something of inestimable value to the dental profession. It simplifies the problem very much, and I am going to ask these gentlemen who are interested in this investigation to study the color problem in connection with this material. In cementing inlays we really get an opaque effect, especially when we look through our inlays into the dark oral cavity. More time has probably been spent upon the color problem than upon any other phase of the porcelain question, and I think it has been with the most disappointing result. Sometimes we think we have arrived at a perfect condition and the very next case is disappointing to us. I shall watch the result of your experiments with this substance with very great interest.

Dr. J. N. Crouse:

I do not quite know what part of the subject to attack. Nearly two years ago I went out to the meeting of the Iowa State Society with Dr. Roach, and on the way home he told me of an experiment which was along a line that I had been thinking of myself, and he and I went into this together. I have been making combinations and sending them down to Dr. Roach and Dr. Perry to test. My first effort, after getting a combination that would glaze and mold well, was to get strength, and when I tell you that the combinations that Dr. Roach is showing here are three times as strong under a scientific test as the porcelain that teeth are made of you will be surprised. For this reason I think that porcelain users will use it in making bridges because you can make a porcelain bridge sufficiently strong so that no human power can break it, without the bars of platinum which are now necessary in a bridge.

The color problem has been a great difficulty with us. I supposed I could send down and have the teeth-makers give us the colors, but the fact is that we use some phosphoric acid and that burns out all the colors that are used in teeth-making. It was necessary to get down to something else and I have had a chemist at work for several months. We have now probably twenty good colors.

Now, I do not take the impression in the way described in the paper. I conceived the idea of having a very stiff modeling compound, and I take the first impression with that and I take a bite impression at the same time. I get enough mass to press into the cavity and have the patient close the teeth at two or three places. I take that off and put a softer modeling compound in there. I make my matrix of Fellowship amalgam. I presume the copper amalgam would be a little easier to pack in, but I use the Fellowship because I do not want to wait two or three days for it to get hard. I think the amalgam matrix is the thing because you can set it there and if there is a little blister formed, or anything disturbed, you will see exactly what it is, and you can take a stone and chip that off easily. I have much difficulty in getting a real good and accurate impression of the teeth. After I have that, I can make a crown in one-half to three-quarters of an hour.

Dr. S. Knowles:

Mr. President—The thing that impressed me with this porcelain is the ease with which it can be worked. Of course, the important thing is to have a perfect model, practically a perfect reproduction of the cavity, in order to get a perfect filling. There is a difference in the thickness of this material which is chipped off afterward, and I think it is possible to make a filling which will fit.

The question of strength is very important, and if this is stronger than the real porcelain it will stand a great deal of strain, because the porcelain which is used today is surprisingly strong.

Dr. D. M. Gallie:

Mr. President—I don't know why you should call upon me to discuss this matter unless it is because you are always courteous. I do not claim to be a mosaic setter or a glass blower. If we are going to have something that will make these restorations a fit, without any question we want it. It has many advantages, the question of color being, of course, an important one. In making porcelain restorations, I would not use it in the anterior teeth, and yet in some places where there is a great loss of tooth structure this no doubt is a good method of restoring, as the rough surface will cause the cement to adhere, and the preparation of the cavity can be made easier and the flat walls will not be necessary. This, I conceive, would be a great advantage in setting some kinds of crowns, where you want a perfect adaptation of the crown to the end of the root, and the sample we have seen this evening would indicate that it is an excellent material for this purpose.

I have no doubt that Dr. Roach will succeed in overcoming the one drawback, which is that of color. Whether he does or not, we in Chicago have reason to be proud of Dr. Roach and of the fact that we have a man in our midst that can accomplish as much as he has accomplished, and I am sure we all hope that Dr. Roach will continue in this research work.

Some of the porcelain inlays I have made have been satisfactory, while others have been misfits. In some cases where there has been some shrinkage, perhaps this substance of Dr. Roach's will come to our rescue and help us to overcome the changing of shade brought about by the different cements. I can say that it will be usable to that extent.

I am very glad to be here, and shall look forward with much interest to the experiments that will be made.

Dr. Rudolph Beck:

Mr. President—I have nothing to say for or against this material at this time. I want to give it a trial and see if it will do what Dr. Roach claims for it. I have seen some of the work and from what he has shown here I believe that it has a place as a filling material. Dr. Taggart has practically condemned it, but I think that if we only consider the one phase, whether it has this property of uniting with cement, it will be a great factor in the use of restorations in posterior teeth. I have not tried it as yet. I have asked the gentlemen to furnish me with some of it and I am going to carry on some experiments, the results of which I hope to report later.

Dr. John Chapman (Southport, England):

Mr. President—It gives me great pleasure to be with you here this evening, except that there is just one little thing that mars the occasion, and that is my having to stand up here and talk to you. As we are your guests, I don't think we ought to be compelled to do things we don't like. I certainly think it is a great pleasure to have heard this paper this evening, but, nevertheleess, I do not intend to get into any scraps that Dr. Taggart spoke about, so I will not attempt to discuss the matter. I certainly think that this porcelain is going to make history. It will simplify matters in the way of porcelain filling very much, and anything that will do that will be a great advance.

The three days I have been in Chicago I have enjoyed as much as any I have ever spent in this country, and the hospitality I have received at your hands and at the hands of the various dentists I have visited has been most enjoyable and pleasant, and I am sure that I shall never forget December 11th and 12th, 1905.

Dr. T. M. Hampton (Helena, Mont.):

I do not feel like discussing this paper, although I have dabbled some in porcelain. I want to thank my good friend Dr. Goslee for starting me five years ago. The importance of this matter, it seems to me, is very great, and I consider myself exceedingly fortunate in having heard this paper, and I want simply to thank each and every one of you, and especially my good friend, Dr. Johnson.

We have a wide country in Montana, and it is hard to get together and get united efforts. Chicago is my Mecca, and I never go back without having gained a great deal from my friends here.

Dr. W. H. G. Logan:

I wish to say a word or two regarding these porcelain inlays fitting better than any other inlays because they dispense with the matrix. It has been an established fact, I believe, that a lining of cement is as large as any matrix; therefore, does not a matrix-made inlay fit as well as this? Dr. Head made these experiments and they were reported in the *Dental Cosmos* three months ago. He proved further that an inlay that did not fit the dental wall stood better under stress than one that did fit.

In this case, we have a substance where we have adhesion. I believe it is better adhesion, and, if it is, then the inlay probably will stay in better, and any inlay that will stay in better should be welcomed because I have seen a good many inlays fall out. This inlay has been recommended for posterior cavities. Is it not a fact that the profession has given up porcelain for posterior cavities? They are using the gold inlay, but this substance, although the color is not quite perfect, is better in this respect than gold. With twenty colors we can get along very well in the posterior part of the mouth. Why can we not use this substance in the anterior teeth with some enamel bodies?

I wish to thank Dr. Perry. It was a pleasure to listen to him when I was a student and hear him remark: "This may not be very artistic, gentlemen, but it lasts." So tonight he has brought us something that will last. Dentists, after all, have but one mission, and that is to save the teeth, and I think this porcelain has a great place because it will save the teeth.

Dr. Hart J. Goslee:

I am very much gratified tonight; first, for the privilege of again being a guest at this hospitable board; secondly, for the privilege of hearing the able paper presented by my old colleague, Professor Perry, and, thirdly, to see the development that Dr. Roach has made in this substance. I can remember quite distinctly, I think, when Dr. Roach first received his incentive to this work through a discussion before the Chicago Dental Society with regard to the possible merits of the combination of porcelain and the oxide of zinc powders.

There is doubtless a great field of usefulness for this composition. I would not call it "opaque dental porcelain," however, for it is not a true porcelain, porcelain being only a portion of it. I think, therefore, that I would modify the name and call it *opaque dental porcelain composition.*

Nevertheless, as I have said, there is undoubtedly a great field of usefulness for this material. It has greater tensile strength and thus will withstand more stress than any of the high or low-fusing materials on the market. For this reason it should be applicable to bridge and crown work, but it is particularly useful in filling large cavities in the posterior teeth.

It is very probable, however, that we will never use it in the anterior part of the mouth where translucency is so essential.

Dr. Perry's idea that we can get a better fit with an inlay of this material does not appeal to me at all because I do not think we *can* get any better fit. There is proportionately the same amount of shrinkage to the last bake that there is to the first bake, and, if it is perfectly molded, the slight shrinkage that takes place in fusing must destroy the accuracy of the fit to some appreciable extent.

Again, I wish to thank the society for the courtesy extended to me, and to congratulate Dr. Roach on the progress made in the development of this material.

Dr. E. M. S. Fernandez:

This porcelain for inlay work is new to me, so I have not had very much experience in this process of work, but I believe it has a place in dentistry.

The very great adhesiveness of its unglazed surface to oxyphosphate cement, and its great power of resistance seems to make it well adapted for fillings in molar cavities. However, I would not recommend it for fillings in anterior teeth.

I made one of these fillings on a disto-occlusal cavity of a first permanent molar today, intending it to be a temporary piece of work, but the result seemed so satisfactory that I feel it will not be necessary to disturb it for a long time, and the time used for the operation in full did not exceed one hour.

I lessened the difficulty of removing the inlay from the cavity by imbedding in the center of the unbaked inlay while in the cavity a small and fine piece of platinum wire, which I used as a handle to remove it by, and when the inlay was finished and cemented to the cavity I cut off the wire with a sharp steel instrument, the wire being so fine that it did not show in the inlay.

Mr. Leslie Perry:

I think it is entirely too early to express myself on this subject. There is no doubt but that it has a place in dentistry, but I think its use will be confined for the time to bridge work and crown work. If it ever reaches the point where it can be adapted to the posterior teeth sufficiently well for the color of the inlays, I believe that will be beneficial. I believe it is something which deserves our attention and I think we may look forward to the time when it will meet a long felt want. I am glad that this comes from Chicago, as most good things in the profession come from this town. I have often made the remark that Chicago beats the world in the dental profession in the matter of ability, and it is needless to say that it is a pleasure to meet with this Society. This is my second opportunity, and I hope I shall have the privilege again.

Dr. J. W. Wassall:

I am always on the lookout for something that will help me in my work, and am not over-conservative in adopting new ideas. I think a material that can be molded into a cavity or on the end of a root so as to take the shape of the surface to be covered, which can then be baked without shrinking too much, would be of great utility. There are many purposes it can be put to, but I can not imagine just where I could use it and get better results from it than I already get from the means I now have at hand.

It should be said in justice to Dr. Perry that he has distinctly stated that this material is not to be used in the front teeth, but only for inlays for bicuspids and molars. If it does make a good inlay, it certainly is much better than amalgam or gold for bicuspids and molars, and it is very much more simply made and has greater resisting power. It does not seem to me, however, to be a good method to use a material that, when pressed into the cavity to take its shape, shrinks so much that more material must be added on its cavity surface. It is not accurate and does not produce results upon which we can depend. The majority of our cases are the beginnings of caries, and I can not conceive how you can manage this material in sulci and fissure cavities, and have accurate and enduring results.

DR. TRUMAN W. BROPHY:

We are all delighted to have with us this evening the gentlemen who have come from so many different parts of the country, and also the young man who spoke to us so beautifully, who comes from across the water. We are always glad to have with us members of the profession from any part of the world.

At the meeting of the British Association at Southport last summer, which perhaps Dr. Chapman attended, a large part of one of the newspapers of that city was given up to the proceedings of the British Dental Association, the like of which I think never occurred before. The character of the work of the Society was of such a high order that it was remarkable, especially along the line of hygiene and education.

This subject of porcelain and the work that has been done by Dr. Roach and Dr. Crouse and Dr. Perry is certainly most commendable. When I was in England the time before the last, Dr. William Mitchell showed me some work he had been doing in painting porcelain, and while this discussion has been going on this evening I expected somebody to say something in regard to painting porcelain. I do not see why this porcelain can not be painted while it is yet in its somewhat plastic state, so that the coloring matter will in a measure enter into the substance of the material, and in this way produce a color that would pretty nearly approach the color of the teeth. Now, these gentlemen will have to stick to it until they get the colors that will be applicable to the various cases, and they will do it. When one starts out to do a thing in this world and is made of the kind of material these gentlemen are made of, he will accomplish it and these gentlemen will develop by and by a material of the proper color that will be manipulated as they have represented. I think when a man conscientiously considers the highest degree of usefulness of a tooth, he will avoid crowning when it is possible. When you can have material that you can make fit, and have a nice, clean wall, the whole tooth clean and the gums healthy, it is much better than to have a gold band around the tooth.

As a member of the profession who has always tried to keep pace with methods and materials that are progressive, I look upon this as one of the valuable innovations, because it tends to make possible the preservation of the teeth without the attendant suffering that has heretofore been caused. This will enable the dentist not only to serve his patient better, but will enable him to preserve his own vitality and live a longer life of usefulness than was possible for those who lived in the times and practiced in the days when the highest degree of skill was called for in the insertion of gold fillings, and when every man who wished to be the head and front of his profession rated his capacity by his ability to insert those extensive and beautiful gold fillings such as Marshall Webb did, but in the insertion of those fillings he was sent to an untimely grave.

DR. F. E. ROACH:

Mr. President—It certainly affords me great pleasure to meet with this society again, and it is very gratifying to hear the liberal and kindly expressions from the members of the society as well as others present.

Naturally, I would be expected to know as much about this material as anyone, having worked with it as I have. I would like to say at this time as a sort of damper on Dr. Perry's enthusiasm regarding the wonderful claims he makes for it, that I am rather inclined to be more conservative about it. I do believe it is possible for the average dentist to get a more perfect inlay with this material than with the ordinary inlay. I do believe that it is possible for such experts as Dr. Taggart and Dr. Wassall to make equally good fitting inlays with the methods they now employ, but I am also quite sure that the manipulation of this material is so much easier that it will be more universally useful in the hands of the average operator. It has been my idea all the time that it would fill a wide field of usefulness in the molar and bicuspid teeth, especially in molar teeth calling for large restorations, instead of the gold crowns. Dr. Brophy struck the key note when he spoke of the possibilities of the material in these large molar restorations. I have used it very extensively in this class of work, and with splendid success, and it is for that class of work that I think the material is most suitable. I have never claimed nor thought that the material would be of any great value for the anterior teeth. I have never said that it would be a substitute for our regular porcelain filling because in this position in the mouth we want translucency, and as this material is opaque, we can not expect it to serve as a substitute.

With the co-operation of Dr. Crouse and his chemists we have made up probably a hundred colors, but of what value are these colors unless they harmonize in translucency with the plain and natural tints and colors of the human teeth? A number of fairly good colors which are far better in appearance than either the gold or amalgam so far as harmonizing with the natural teeth is concerned.

Another advantage is that there is better adhesion of the cement to the material. The cement does not have a tendency to disintegrate from the margin, even though the joint is not so accurate as it is possible to get it with a gold inlay.

Of course, strength is another great advantage which makes the material very useful.

I feel like defending Dr. Taggart's stand in this matter because I know it is not his intention to give the material a black eye. From my talks with him I know he heartily indorses the material, provided it can be made use of in the way we have been claiming, and I think he will probably find a place for it in his practice for a certain class of cases.

While the materials are not yet perfected to our satisfaction, and the technique of manipulation is not all that we expect, it is nevertheless a valuable material at present.

Dr. E. J. Perry:

Dr. Taggart referred to the misfits that had been sent around, but I wish to state that I did not send any inlays around. All that was sent around were some refitted Logan crowns, and if Dr. Taggart, who is considered to be an expert, can grind the root end of a Logan crown to fit the end of a root as well as that, I will take off my hat to him. A filling material which can be placed in the hands of the average man with which he can produce as good an inlay as we are able to show, is certainly an advantage to the profession.

I stated in my paper that the lining of the inlay was a hard biscuit bake. That is, the last bake that the inlay received was only sufficient to fuse to a glaze the enamel which was upon the exposed surface of the lining, and I specified that the shrinkage that took place in the foundation body took place after the fusing.

Now, in the paper I did not claim that this porcelain was usable in the front teeth, but on the contrary, I stated specifically that on account of its opacity it was indicated only in places in the mouth where the teeth were seldom exposed to view, and further specified that it was most especially indicated in those large cavities in the molar teeth. There comes to every one of us a class of cavities that we do not know what to do with. The teeth are not bad enough to cut off and crown and it is undesirable to crown them as Dr. Brophy has said. What do you do? You fill the tooth with amalgam only to postpone the crowning. In this class of cases this substance is most especially indicated, and I stated as much in the paper, and I do not see why anyone should claim that I was making comparisons with other material. We can not do without translucent porcelain as yet. I use it in practice constantly, and I have little use for the professional man who uses only this or that. I put in a plea for eclecticism in practice. You have use for gold, for gutta percha, sometimes for copper amalgam for filling material, as well as the common amalgam. You often have use for translucent porcelain and often opaque porcelain. All of them are useful and any of them are best when indicated, and if I tried to make anything plain I tried to make plain the fact that this material is best under its indications, and that it is better in some regards because of the peculiar and distinctive quality that it possesses in adhering to the cement and changing the character of the cement to an insoluble cementing medium.

The inventor has had the temerity to charge me with being an enthusiast. I know that I am doing better dentistry since I have adopted the use of this opaque porcelain, and I feel as chairman of the program committee that I have done this society a geat favor in introducing the substance to it.

CHICAGO-ODONTOGRAPHIC SOCIETY.

A regular meeting was held December 19, 1905, with the president, Dr. W. H. Taggart, in the chair.

Dr. C. Edmund Kells, Jr., of New Orleans, La., read a paper (by invitation) entitled "From the Microbe's Point of View."

Dr. C. N. Johnson

Was asked to open the discussion. He said: Mr. President and Gentlemen—It is with a great degree of embarrassment that I attempt to open the discussion on this very interesting paper, particularly in view of the fact that I am totally ignorant about the subject. However, if a man is ignorant, he is sometimes able to ask some pertinent questions, and it is in the nature of questioning more than any other that I purpose taking up a few minutes.

Now, when Dr. Kells made the statement in his paper that he filled all the pulp-canals immediately, irrespective of the presence of blood and pus, someone said to me, "You can talk about that." But I am going to disappoint the gentlemen in that regard for two reasons. First, I do not want to divert the discussion into that particular line of thought. Second, and I say this for the benefit of those who are to follow me, Dr. Kells never gets up before an audience and makes a statement like he has made without good reason for making it, and the most I am going to do in that connection is to ask Dr. Kells, when he closes the discussion, in a brief way to tell us his reasons, because Dr. Kells never does anything without a reason.

It is needless to say I have been delighted with the paper; it is a masterly presentation of the subject. It is an object lesson. None of us can ignore the revelations we find in connection with the position of the third molars. I wonder if Dr. Kells will correct his nomenclature a little. He called them wisdom teeth. I wish he had said third molars. I wish he had said pulps when he said nerves. We all use those terms occasionally; we drop into that nomenclature; but it is the trend of dental teaching to drop such terms as wisdom teeth, six-year molar, nerves, etc., and I think Dr. Kells will pardon me for referring to that. But the revelation of these impacted third molars, which could not be told so eloquently in any other way or by any other means, is a sufficient endorsement for the Roentgen Ray.

There is one thing he did not speak about in connection with the use of the X-ray and I want to bring it up. Sometimes an accident happens by which a barbed broach is broken in the pulp canal. I know of a case of that kind that occurred very recently, and the accident caused considerable anxiety upon the part of the operator. The X-ray was made use of to try and discover whether the broach could be located or not. It was not a success, so far as locating the broach was concerned, and I want to ask Dr. Kells if it is possible by the expert use of the X-ray to locate definitely the position of a broken broach far down in the canal? If that can be done, it will add one more important use to the Roentgen ray which will clear up many cases which tend to make us all gray haired if we practice long enough. I have not put a barbed broach in the canal of a tooth for ten or fifteen years, and I do not think I shall do so again, although many excellent operators claim to get the best results with a barbed broach in cleaning out these canals. If there is any way of locating accurately a broken broach in a canal by means of the Roentgen ray we want to know it, and I wish Dr. Kells would bring that out in his closing remarks.

Personally, I wish to thank Dr. Kells for coming so far and presenting such an admirable paper. It is a feature of the winter's work of this society, and I am sure he has not only my personal thanks, but the thanks of the whole society for bringing this subject so clearly and admirably before us.

Dr. C. P. Pruyn:

In a little talk with Dr. Johnson previous to the opening of the meeting I said to him I was glad he was to open the discussion because he would say all I wanted to say, and say it better than I could, and that when it came to my time to speak I would simply say Amen to what he has said. I wish to reiterate the kind words he said about Dr. Kells, and his courtesy in coming here from a distant city to present this excellent paper.

I want to ask a question or two with regard to the use of the X-ray. First, as to the expense of the apparatus, and whether Dr. Kells would think it practicable and proper for each and every dentist to have an apparatus of this kind in his office. Again, whether it would be wise, in a city like Chicago, where we have a number of X-ray operators, to send our patients to X-ray experts rather than undertake to do the work ourselves.

Dr. H. L. Lewis (by invitation):

The dental branch of skiagraphy is not new to me, although it may be to some of you. The skiagraphs we have seen this evening are exceptionally good.

One reason, I believe, why the dentists of Chicago have not made more use of the X-ray and of skiagraphy is largely due to the fact that this work has been turned over to the physician and surgeon or to skiagraphers who do not understand dentistry and who do not appreciate what the dentist is after. I think as soon as the skiagrapher realizes that the dentist needs more than the application of the X-ray in such a way that impacted teeth can be located, etc., better skiagraphic work will be done.

I have found, as a rule, that not over three teeth can be skiagraphed successfully on a film small enough to be placed in the mouth, and I think Dr. Kells' skiagraphs will bear out that statement. If you will remember, the one central tooth he has taken as his focus is the only tooth he has attempted to show in detail. The mistake has been made by skiagraphers outside the dental line to attempt to take too many teeth, and in that way they have failed. One of the reasons we have so much difficulty in getting a proper skiagraph is in not being able to place a large enough film in the mouth without producing gagging, and thus fogging of the skiagraph due to movement.

I do not think I can offer anything in skiagraphic work that will be an improvement on what you have seen tonight.

The reason you have not perhaps used the X-ray as much as you should is simply due to the fact, so far as I know, that there are no dentists in Chicago who make a specialty of this line of work. Dental skiagraphy belongs to the dentist. He alone appreciates and knows what the dentist requires, and it is only natural for him to expect to get better results.

Dr. W. H. G. Logan:

I wish to say a word or two, first, with reference to the statement that is generally made by X-ray workers, namely, that they can positively tell whether a root canal is properly filled or not. I would also question their ability to tell the amount of regeneration of tissue that has occurred or is occurring in an alveolar abscess that is filling up the cavity.

In taking up the possibilities and probabilities of diagnosing as to whether a root canal is properly filled or not, I would like to ask Dr. Kells if he has here or has any skiagraph showing the presence of chloropercha in any root canal. He said no, but he said he could produce it.

Dr. Kells:

I think I said, if there was a sufficient film to cast a shadow it might be reproduced, but that if it is only a thin film it would not cast a shadow and consequently could not be reproduced.

Dr. Logan (resuming):

I wish to modify what I said to that effect. I am glad Dr. Kells spoke of that. What I maintain is, that if a root canal is filled at all in the apical portion beyond the larger portion of the canal, it is filled with chloropercha and not with a solid gutta percha cone. The cone usually stops at the dentine and the chlorapercha fills the restricted part in the cementum. If you have not carried a gutta percha cone to the end, or a great amount of chloropercha, you can not prove by taking a skiagraph that it is present. I would say that you can always tell when gutta percha is in a root canal, but you can not always tell whether the canal is practically filled or not. You can tell exactly the location of the gutta percha in every root canal, whether it is in the canal or has passed through the end where the opening is exceptionally large into the tissue. Furthermore, you can tell if you have broken off a broach in there.

One speaker asked the question could we locate a broach with the X-ray? It is an easy thing to do, because it is metal, and it can be located and its position determined. The reason that gentleman did not find whether the broken piece of broach was in the canal or not was because he did not find the end of the root. The skiagraph did not show it.

Another question that is of great importance is whether we can tell by the X-ray the amount of regeneration of tissue in the field where an abscess has formed about the end of the root. We can tell by observing a skiagraph, if the picture has been properly taken, the amount of bone destruction. We can tell the amount of absorption of that root. But what I maintain is, that if the side walls of the alveolar process and bone are intact, are normal, we can not tell the amount of regeneration of tissue, for the simple reason that it is connective tissue when it first forms and for a long time afterward.

Many of you doubtless did not notice closely the picture where the tissue had formed over the root of that third molar. The tissue about it was healthy, and it showed quite a little absorption and destruction of the bone right around the end of the root, as I remember it.

Another point I wanted to make is this, that it takes a long time for bone to reproduce itself, if it ever does, in these spaces or places, and since we want to know in filling root canals if we have had a regeneration sufficient to fill that cavity before we fill the root canal, provided we do not do it immediately, we can not do it by the X-ray because the ray will be obstructed by the bone and it will not outline fibrous tissue in the center of bone. Mark you, I am not saying that that bone is not reproduced, but I wish to say that it is a long time whenever it does occur.

Finally, I want to say that Dr. Kells has been an original investigator in this work. The first paper I heard him read was at Niagara Falls, in 1899; and if any of you wish to go into this particular work you will find a chapter on dental skiagraphy which has been contributed to Monell's work by Dr. Kells. As an original investigator Dr. Kells is entitled to great credit for developing this particular phase of a specialty in connection with dental work.

Dr. Arthur D. Black:

I wish to say a word on the subject of root canal filling. I am very glad Dr. Kells brought that question up in his paper, for I believe a large percentage of us treat these cases entirely too much through the pulp chamber. I believe if we can not get results in two or three treatments we are justified in concluding that there is trouble around the end of the root which we will not be able to properly handle through the pulp chamber. In such cases I prefer to fill the root canal, and, if necessary, make an opening through the alveolar process. I believe it is a mistake to carry a tooth along through weeks and weeks of treatment through the pulp chamber, and many of us make a mistake in treating such teeth too often. Unless something calls for it we ought not to treat a tooth through the pulp canal oftener than once a week. Whenever an abscess forms about a root it nearly always surrounds the apex of the root. It destroys the peridental membrane around the sides of the root, consequently treatment through the root canal does not get at what we want, and after pus has been present for a long time, if the surface of the root has been bathed in pus for many weeks, we will get satisfactory results from treatment through the pulp chamber in very few cases. I have not practiced immediate root filling in such cases but I have done it "more immediately" than is the general custom.

Since Dr. Johnson has brought up the matter of nomenclature I want to call attention to a misnomer in the paper, and that is the use of the word fistula in connection with an abscess. It is not correct to say that an abscess has a fistulous opening. A fistula is an opening that carries normal secretion; that is, if we have an opening from the parotid gland through the cheek, carrying saliva, that is a salivary fistula. If we have an opening from an abscess carrying pus, that is not a fistula, but a sinus. A sinus always carries pus; a fistula never carries pus.

I think an explanation can be given of the root and the gold screw which remained in the tissues without any irritation or sinus being present. We find many men who are going around carrying bullets in the tissues of the body without giving them any trouble, for the simple reason that these bullets were sterile when they entered the body and have become encysted. The same may be said with reference to the root. If a root is broken off, after the canal has been previously filled, and it had been filled in the case mentioned, there is no reason to my mind why the broken end of the root may not be encysted if it is sterile, the same as does any other sterile foreign body. It is common to leave silver wire in the tissues, when it is used in cases of fractures of bones, and healing takes place without difficulty. I recall the case of a boy who a few years ago fell and broke off the incisal end of a central incisor, which exposed the pulp and he came in some months afterward for treatment. In examining the case it was noticed that there was something the matter with the boy's lip, and on feeling it and looking at the teeth the dentist made up his mind that a piece of the tooth was embedded in the lip, and in making an incision he removed the broken piece of the incisor tooth. The lip had healed over and the foreign body had become encysted there. There was no sinus.

I think we must all agree with Dr. Kells as to the importance and value of the X-ray to dentists, in diagnosis, but many of us would be disappointed if each of us should buy an X-ray outfit and start in this work, because we would not get for some time to come the excellent results that Dr. Kells has obtained. I have no doubt, however, we should get results of great value to us; but we must remember that Dr. Kells is probably more familiar with this particular line of work than any other dentist. There are cases, however, in which there is danger of our being led into error in making a diagnosis with the aid of the X-ray. That is, sometimes we will not see things we ought to see. As a case in point I recall recently the case of a man whose jaw was supposed to be broken. It was examined by the X-ray and a fracture was not seen. Nevertheless, there was a fracture present, and in examining the case subsequently it was easy to move the parts. The fracture in this case was at the angle of the jaw, within the fibers of the masseter muscle, and as there was no displacement the line of the fracture did not show.

I simply called attention to the fact that the X-ray in this work is not infallible; yet it is certainly of great value to us in diagnosing.

Dr. J. R. Knapp, of New Orleans, La.:

It is a great privilege to be present here and to meet with you. Chicago is a wonderful city; wonderful in its magnificent buildings; wonderful in its great expanse; wonderful in its beautiful boulevards, drives and parks, and wonderful in this great dental society. It is also remarkable in having dentists who are fully abreast of the times. They are the leaders of the dental profession throughout the world.

With reference to the paper of Dr. Kells there are a great many things in it that most of us know very little about. I have given the matter of X-ray very little attention and study myself, and I am not qualified to discuss the real merits of his paper.

There was a slide shown tonight where a third molar was forcing itself upon the distal surface of a second molar, and in so doing it caused some erosion thereby, or absorption.

Dr. Kells:

Abrasion.

Dr. Knapp:

Part of the tooth structure was gone, and my friend extracted the second molar. I had a case very similar to that, and I prepared the root of the second molar for crowning, and by the way, there is not one dentist out of fifty who can prepare a root properly for crowning. Pardon me for making that statement. The preparation of the root gave sufficient space for the crown to be inserted. I waited a short time for this malposed third molar, and it came properly into position.

I am very proud to be present with you this evening, and should any of you see fit to come to New Orleans at any time I shall be glad to have you do so. We find that Chicago is not only great in its magnitude, but great in its beautiful and wonderful things we have been speaking of this evening. It is also great in its hospitality and in kindly disposition and in the goodness of heart of the dentists of this society.

Dr Walter M. Bartlett, of St. Louis, Mo.:

I do not think I can add anything of interest to the discussion of this excellent paper. I think I can safely say this, however, that in order to make a success in X-ray work one must have necessarily the knowledge and skill which the essayist possesses.

I have been very much interested in Dr. Kells' paper, and am glad that he has brought out this splendid method in using the X-ray, showing the abnormal positions of teeth in the jaws, showing defective root canal fillings, showing us faulty crowns in position, and also showing us a number of things that can not but be a positive benefit to the dental profession.

Dr. Kells wrote me that he was coming up here to read his paper tonight, and I immediately took advantage of the opportunity to come here from St. Louis. I have enjoyed his paper very much, and it is needless to say I enjoy the meetings here, because I always have a good time. The boys never neglect me—in fact, they pay too much attention to me. I always like to come to Chicago, and I am pleased to have met with you again.

Dr. Elliott, of Birmingham, England:

Mr. President—I thank you, sir, for calling upon me, and yet, on the other hand, I do not thank you. I thank you in the first place, because of the compliment you extend to me as representing our fellow practitioners in England. On the other hand, I feel that I can not thank you, sir, because I am not accustomed to speaking to so large a scientific audience. We in the old country, in England, at least, when we have to speak upon dental subjects—which I never do—we speak generally to empty benches, to small gatherings indeed, and it is to me a great delight to see the enthusiasm that you put into your profession in this part of the world. We in England hear a great deal of what is being done in this great city from a dental point of view, and I came here with the intention of just looking at it, of saying that I have been here, in order that I would be able to tell them the mere fact that I have seen the celebrated Chicago dental schools. You know, I thought I could do all that with the greatest possible satisfaction to myself in the course of, say, one day or two (laughter), but I find that really it will take, properly speaking, a week or two.

I do not intend, sir, to discuss this paper, as I do not feel at all competent to do so. It is one of those subjects which to my mind should be regarded as a specialty of itself. We in England, when we want to have an X-ray taken, get it done by someone who is constsantly doing that class of work. I myself have done very little with regard to it.

I came here with the main object of learning what I could from the members in this great and progressive city—a city which we in England hardly realize is so progressive. We hardly realize its great strength in every respect, and I am sure it is one of those cycles in the course of Nature when we find that civilization, progressiveness, and all that brings forward the highest in the hearts and in the lives of men, namely, progression from the east to the west that happened in the ages long ago, and which seems to be happening today here, and in England we are only too pleased to acknowledge the indebtedness that we feel to you in this country for what we see done in our own profession.

I wish to thank you, sir, and I thank you gentlemen, for your kindly hospitality on this occasion, and I trust I may have the opportunity at some future time of visiting this great city again. (Applause.)

Dr. James F. Austin, of St. Louis, Mo.:

I did not expect to be called upon to say anything on this subject, because I am not familiar with it. I will say one thing, however, for Chicago. I attended the meeting of the Odontographic Society about three years ago, and it was the largest meeting that I ever attended and about the largest that I ever expect to attend. I never come to Chicago without feeling that I am very much at home. When I go home I am anxious to come back again. I have learned more tonight regarding the X-ray and other things than I have learned in a good many months. I know that the dentists of Chicago are progressive men; that they could not help but be progressive men when they have two such dental schools in Chicago, and have such men here as Dr. Black, Dr. Brophy, Dr. Johnson, Dr. Noyes, men whom the profession look up to and try to walk in their footsteps. (Applause.)

Dr. H. A. Cross:

The essayist has read some very interesting things to us this evening, some of which, if we properly understand him, are quite startling. His exhibits have been of unusual interest, which, together with his paper, reflects much credit upon him.

While he was describing a very ingenious method for dealing with those cases in which an opening had accidentally been made from a root canal out through the side of the root at some distance from the apical end of the root, I listened very attentively to hear what he might have to say about dealing with that portion of the root canal between the cut or opening out through the side of the root and the apical end of the root.

I agree with another speaker who has preceded me in saying that it is most important to give proper attention to that portion of the root canal at and near the apical end of the root.

Are we to take it for granted that in those cases cited by Dr. Kells, in which an opening had been made through the side of the root from the root canal, that the canals had been previously properly treated and filled, and that the opening had been made by a dentist in an effort to make a post hole in the root for a crown, or were they cases in which a dentist had accidently cut through the side of the root while using a bur in the canal during treatment? (I did a little of that in my early practice.) If the latter be the case, and that portion of the root canal between the side opening referred to and the apical end of the root were to receive no attention, I would be apprehensive of trouble afterward. If the former is what we are to consider I fail to understand how a crown with a post could be attached to a root which had been dealt with in the manner described to us by Dr. Kells, since he plugs the canal full with lead cone.

DR. R. J. CRUISE:

I want to say a few words with reference to that phase of Dr. Kells' paper which dealt with the immediate filling of root canals. I have for two or three years been endeavoring to find a scientific reason why, or why not, root canals should be filled immediately, when we find the very worst possible conditions of putrescence, abscess and infection at their base. But I have not been able to get from any of those sources to which I would naturally look for information anything like encouragement or reasons for doing so. Therefore, I have not had the nerve to do it myself. I think the percentage of dentists who resort to the immediate filling of root canals is very small. However, I have a friend, Dr. C. L. Lind, who practices in this city, and is now on vacation in Mexico, who has made it a practice for the past two years to fill root canals immediately, irrespective of the worst possible conditions at the apical foramen, and my statement will be corroborated by Dr. B. J. Cigrand, if he is in the hall. While this practitioner has been doing this he has not been able to give a strictly scientific reason for his action.

I was much delighted to hear Dr. Kells bring up this subject, because I thought he would give scientific reasons for so doing.

This practitioner, to whom I have referred, told me to try it, and he said that if I did so I would not regret it. However, I have not had the nerve to do it because it seems to me unscientific. He says that he has not had a single case of trouble following it, and he does not advance or claim any scientific reasons for it. However it stops the trouble in the teeth, or at least, the trouble will cease by the kindness of nature. He told me that in his first case he resorted to this treatment by accident. A man came to him with a badly abscessed tooth. He filled it because the gentleman was about to leave town and it was either a case of filling it or taking chances in not doing so, or of having it extracted. He filled the tooth, and there was no trouble. He has followed up this method of treatment, thoroughly cleansing the root canals. Of course, in doing this, one can not help forcing putrescent matter where it should not go, but by following the cleansing with medicaments he says the trouble can be eradicated.

After this gentleman's experience I am encouraged to do this in same cases, and when a man like Dr. Kells says he does it, before this society, I am inclined to believe there is something in it, and I am going to try it.

Dr. J. P. Buckley:

I had hoped to hear Dr. Kells give a scientific reason for his method of immediate root filling. I am going to discourage Dr. Cruise, a classmate and good friend of mine, from following out the method which he contemplates doing. I believe, irrespective of what Dr. Kells may say in substantiation of his method, that it is bad practice to go down into a root canal and fill it immediately in a case of blind abscess, and I believe, looking at this subject from "a microbe's point of view," if we have a streptococcus there or if one of these microbes should happen to be a streptococcus, the patient is going to have subsequent trouble, and Dr. Kells, or at least the patient, will regret having had the root canal filled at that time. I say without any hesitation, although I dislike to say it, that when a man of the professional standing of Dr. Kells makes a radical statement before a society like this it should be accompanied with his reasons for so doing. Before I can adopt this method, you will have to show me the reason for filling these root canals at that particular time; and you will have to show me that there will be no subsequent trouble in those cases. I am just as anxious to fill root canals as any of you and one of the things I teach in school is that when a root canal is ready to fill, fill it. But do not fill it until it *is* ready to be filled. I do not believe in a long series of unnecessary treatments, but I want these root canals ready to fill before I attempt to fill them. I do not believe in putrescent pulps and blind abscesses that the canals can be put in a condition to fill at the first sitting. If they can be, and Dr. Kells could have shown me a plausible reason why they can and should be two or three years ago, it would have saved me a great many sleepless nights, because I have spent some time in working out a method by which these conditions can be treated rationally, and I can not believe as yet, until Dr. Kells makes his explanation, that his method is a rational one for treating these conditions.

There can be no question about the value of the X-ray, so far as diagnosing certain conditions is concerned. I think Dr. Johnson is correct, that if it does not do anything else but locate a broken broach in a canal it is a valuable aid. It is an adjunct also, according to the remarks of Dr. Kells, in enabling us to locate the proper position of an impacted third molar. In a case he reported the impaction had caused absorption of the distal root of the second molar, in which there was exposure of the pulp, followed by extreme facial neuralgia. I learned of a similar case last week where it was thought necessary to extract a second molar, and a dentist reported a case of impaction where there was absorption of the distal root of the second molar, with exposure of the pulp and facial neuralgia. In that case if the third molar has been extracted, leaving the second molar in place, it would not have relieved the condition of the patient without extraction or devitalization of the pulp of the second molar. While the X-ray is useful and valuable in diagnosing cases of impaction of third molars, or impacted teeth wherever they may be, or non-eruptive teeth, and while we can locate metallic substances within the tooth structure, I do not believe it is as valuable in locating an abscess about the roots of teeth, as some of the X-ray men would lead us to believe.

In this city, in a medical society, not long ago one of the best surgeons got up and said at the meeting at which the use of the X-ray was discussed, that he saw one of the most beautiful cases of gall stones in a skiagraph he had ever seen. The symptoms indicating this condition also, he anesthetized the patient, cut down, and to his utter surprise failed to find a gall stone or gall stones. He went to look for the trouble and found in interpreting the plate that in photographing a spot appeared on the skiagraph where the gall-stone was supposed to be. As I have said, while the X-ray is a valuable aid, I do not believe it is as valuable in diagnosing certain conditions, either in general or dental surgery, as we have been led to believe by some X-ray men.

Dr. George W. Whitefield:

I would like to say a few words in connection with Dr. Kells' paper, and I shall probably approach the subject from a little different standpoint than most of the other gentlemen. A number of years ago I was a great advocate of immediate root filling. I did a great deal of work in that direction. Years afterward, in taking off crowns, or where I wished to change the work, I found that where I had employed the method of immediate root filling that the root fillings were foul if I drilled into them, because I did not treat the tubuli, but simply disinfected and filled the canals and pulp chamber.

Dr. Truman W. Brophy:

We have had the pleasure this evening of listening to a contribution from a dentist who, through his genius, has evolved many valuable electrical devices, and on the screen we saw only a small part of his remarkable work. Some of us are familiar with the work of the distinguished essayist, and I am one of those who believe that it is better to speak well of men when they are alive, and praise their work, rather than to wait until they have passed away.

That part of Dr. Kells' work which appealed to me, and which I regard as the most valuable part of it, is his work from a pathological point of view—the abnormalities of position of the teeth, the physical disturbances, the abnormal positions of the teeth brought about by the presence of foreign substances in the canals of the teeth. These are subjects that are interesting to dentists.

The question of the physical disturbances that cause pain has been beautifully presented to us this evening. The abnormalities of the teeth, the destruction of pulp canals, the treatment of these canals and the filling of them are only a part of the subject. Neuralgias come from abnormally posed teeth. For instance, we may have disturbances in the lower maxillary bone, disturbances from the great trunk nerve that passes through the inferior maxillary canal by the direct pressure of a malposed tooth upon it. This phase of the subject appeals to me because I am dealing all the time with such morbid conditions, trying to relieve the suffering by the removal of the causes of these conditions, and so when these pictures were thrown upon the screen many of the cases of patients came back to me, who had suffered for years and years from pain which never had been located. The seat of the trouble or pain had not been discovered.

One day last week I had a patient who had suffered for months from extensive swelling of the cheek, involving the eye, and practically closing it. His physician said that he was suffering from a tumor. In operating I found a cuspid tooth lying just below the infraorbital ridge and crosswise, which was the cause of the disturbance. It had brought about, by its abnormal site, destruction of a considerable part of the maxillary bone by caries. This was removed and the patient recovered. It is in these conditions sometimes, where there is long continued suffering, we find it difficult to locate the cause, and in them the X-ray will undoubtedly prove a great aid to us. However, one must be expert in the use of the X-ray in order to interpret correctly the skiagraphs.

Dr. Thomas L. Gilmer:

I appreciate the paper very much, especially that part of it which refers to the use of the X-ray. I have for a long time used the X-ray as an aid to diagnosis in my surgical work, and find it very helpful in many cases. I do not make the pictures myself, and would suggest to those who wish to make use of the X-ray that they do not send their patients to the X-ray man to have a picture taken without the most explicit instructions of what is required by telephone or letter, or, what is far better still, go with the patient and see that the exposures are made right. I should not like to take up the work of the X-ray specialist. While it is possible for one, situated as we understand Dr. Kells to be, to do this work, and do it well, as a rule it seems to me that it would be better for us to employ a specialist in this work rather than attempt it ourselves. We go to a photographer when we wish to get a first-class portrait made, although we may be able to make exposures, develop plates and print pictures, still our work is very amateurish as compared with the specialist in this line. So it is in the X-ray work, as compared with fine work done by the specialist, it is only amateurish. I have discovered by the use of the X-ray some very unexpected conditions, and have been able to arrive at a diagnosis through its aid which would have been impossible had I not brought to my aid this most valuable assistant.

Dr. E. M. S. Fernandez:

I have been very much interested in Dr. Kells' paper, and if it were not for one point that has not been spoken of, I would not have gotten up to say anything. However, I am very anxious to know something about this point.

About eight years ago, in doing some X-ray work, I burned my hands twice. I found it extremely difficult work to do and that it required considerable time and attention the same as other kinds of scientific work. What interests me particularly is the possibility of burning by the X-ray. I want to know whether there is any way of preventing the action of the X-ray on the skin of the face of a patient. Is there any method or means of protection by which we can avoid these burns? X-ray burns are serious things, and I believe it is important that we should look into them and see if there is any way to guard against their occurrence. I hope Dr. Kells will tell us something about how to prevent these burns in closing the discussion.

I hope that before long we will have a specialist in this city on X-ray work as applied to dentistry. We certainly need such a specialist as much as we need a specialist in orthodontia, a specialist for the extraction of teeth, or a specialist for the administration of nitrous oxide gas.

I recall the case of a lady, 38 or 40 years of age, who had nearly all her upper teeth extracted. Some were roots, while others were teeth. The trouble was caused by pyorrhea. Dr. Slonaker, three years afterward, said there was an abscess at the right upper cuspid. The case was taken to a specialist in this town, who X-rayed the patient's mouth, and they came to the conclusion that there was a malposed cuspid. She was operated on under nitrous oxide gas anesthesia, and was discharged a short time afterward as being all right. In three weeks she came back with a continuous discharge from this region, in spite of the fact that the skiagraph showed a malposed cuspid. I do not wish to convey the idea that the skiagraphic work was wrong, but there was a mistake in the work not being done right. Now, if an ordinary dentist can not accomplish this work, he can not afford to have an X-ray machine and make skiagraphs of patients' mouths. He can not expect to get fine results. This skiagraph was well made and showed beautifully a malposed tooth. But there was no such thing. I took the patient to Dr. MaWhinney. We made a careful examination of the mouth and found a body toward the lower part of the alveolus. The patient was given gas, and Dr. MaWhinney extracted a small portion of the root, and the woman was well in a week. She is well today. This case occurred eight months ago.

I have related this case because of its interest in connection with X-ray work. I believe the X-ray is an aid to us in dental work. I believe it will enlighten us in a great many treatments. We need to use it. Malposed teeth cause more trouble sometimes than we are aware of. There have been many teeth lost that had no need of being lost if we had had the proper means of taking good skiagraphs of the mouth.

I hope Dr. Kells will speak about X-ray burns in his closing remarks, because these burns cause much trouble. In medicine it has caused the loss of limbs on account of extensive burns, and it has caused many other troubles with which I am not familiar.

Dr. Kells (closing the discussion):

As the title of my paper was "From the Microbe's Point of View," and was strictly an X-ray subject, I shall confine my answers to the questions that have been asked with regard to the X-ray, and not to those with reference to immediate root filling; consequently there is not much left for me to say.

One thing which impressed me was the narration of the case by Dr. Buckley, where a surgeon from a skiagraph cut down for a gall-stone, could not find it, and it was shown afterward to be a defect on the film. I do not think any surgeon should rely on one picture or skiagraph of a gall-stone, a kidney-stone, or anything so uncertain. Any surgen who operates on such a case on the strength of a revelation of one skiagraph alone needs teaching. No dentist has a right to operate on an impacted cuspid tooth unless skiagraphs show plainly that tooth, and he should not blame skiagraphy at all if he should cut down into the jaw upon the basis of an imperfect picture and find nothing. X-ray work may be inaccurate by reason of faulty or defective manipulations. X-ray work is not infallible. X-ray pictures are shadows, and they may be treacherous. Scarcely any dental X-ray picture can be interpreted by anyone other than a dentist. If there should be a certain tooth lying up in the alveolus, the dentist would recognize it. An X-ray picture may easily mislead one. Therefore, we must be very careful and not be misled.

With reference to burns, I will say, in answer to the remarks of Dr. Fernandez, that it is absolutely impossible to burn a patient in taking a practical X-ray picture of the mouth. It is true that those who are taking X-ray pictures constantly, with long exposures, are subject to burns, but they may not be burned for one, two or three years, because the effects of the X-ray are cumulative. Physicians who use the X-ray may burn patients in treating cases therapeutically, but this is out of our line.

You are supposed to bring a patient to the verge of a burn when treating him therapeutically. You may bring him to the verge of a burn and yet carry him along without it, or you may carry it too far and produce bad results. Instantaneous exposures, or slight exposures, will not do for therapeutic work. Burns may occur from the improper use of the X-ray, but, with the proper use of it, it is absolutely impossible to burn a patient in the few seconds that are required for most dental purposes. That has been proven time and again. I may say that I have exposed several thousand patients to the influence of the X-ray and have never had a case of burn. Originally, I consumed about five minutes for each picture, but I would not then take three or four pictures of the same patient at the same sitting. Now I take these pictures in from one to three seconds. Sometimes in the denser tissues, as, for instance, in taking a picture of an impacted third molar, it may require six seconds. This, of course, eliminates the question of burns absolutely.

As to the cuspid tooth, in my practice I have never found a case in which a missing cuspid had not been found. The reason I said this is because it is generally supposed by the dental fraternity that all teeth may be missing in the jaw except the cuspids, and they say that the cuspids are never missing. Recently a man came to my office who said he never had a left upper cuspid tooth: I looked for it and did not find it. I never take a patient's word for anything unless I have corroborative evidence. He may have lost this tooth when ten years of age and forgotten all about it. He is thirty now. I have found cuspids lying across the median line; I have found them in the roof of the mouth. I have never found one back of the first bicuspid.

Dr. Fernandez:

I would like to ask Dr. Kells whether there is any means of protecting the eyes while taking X-ray pictures?

Dr. Kells:

I do not think it is essential to have anything of this kind, for in dental work the process is so instantaneous that it is not necessary.

THE DENTAL REVIEW.

Devoted to the Advancement of Dental Science.

PUBLISHED MONTHLY.

EDITOR: C. N. JOHNSON, M. A., L. D. S., D. D. S.

Subscription price $1.00 a year including postage, to all parts of the United States and its possessions, Cuba, Canada and Mexico. All other countries $1.75 a year.

EDITORIAL.

TO CROWN OR NOT TO CROWN.

At the recent meeting of the Alumni Association of the Chicago College of Dental Surgery Dr. J. D. Patterson, of Kansas City, read a very instructive paper on "The Gingival Border," in which he took decided stand against the abuse of this tissue by banded crowns. He claimed that the irritation of bands had caused the loss of many teeth, and that wherever crowning was necessary it could be accomplished without bands. As to the relative merits of banded or bandless crowns we are not disposed to enter into argument at this time, except to state that it is manifestly evident that many bands do undoubtedly cause more harm in irritation than the good they accomplish in strengthening the root.

But what we wish particularly to emphasize is the oft-repeated contention that crowning is so frequently resorted to in cases where it is wholly unnecessary. In the face of all that has been spoken and written upon the subject the fact still remains that this is one of the crying shames of dentistry. Men still continue to take molars and bicuspids with nothing more seriously wrong than an ordinary proximo-occlusal cavity and grind off the tips of the cusps and slip on a shell gold crown. They also cut off an incisor under the same circumstances, and even go so far in some instances as to advocate a crown where there is only a simple proximal cavity if the form of the natural tooth is not as "pretty" as they think they can make a porcelain crown. This is folly run into injustice, and be it said it is not done by the most expert crown workers. The men who have attained to the highest perfection in crown work have discovered its limitations and learned conservatism.

But the extent of needless crowning by irresponsible practitioners has become really a reflection on the profession, and this is particularly true since inlay work has reached its present stage of efficiency. Inlay work steps in to fill the breach between ordinary filling and the ultimate and last resource of a crown. Let each practitioner, when a patient is in his chair, do as he would wish to be done by under like conditions, and there will be fewer crowns and more fillings and inlays.

THE EDITOR'S DESK.

MY SUMMER VACATION.

[Continued from March DENTAL REVIEW.]

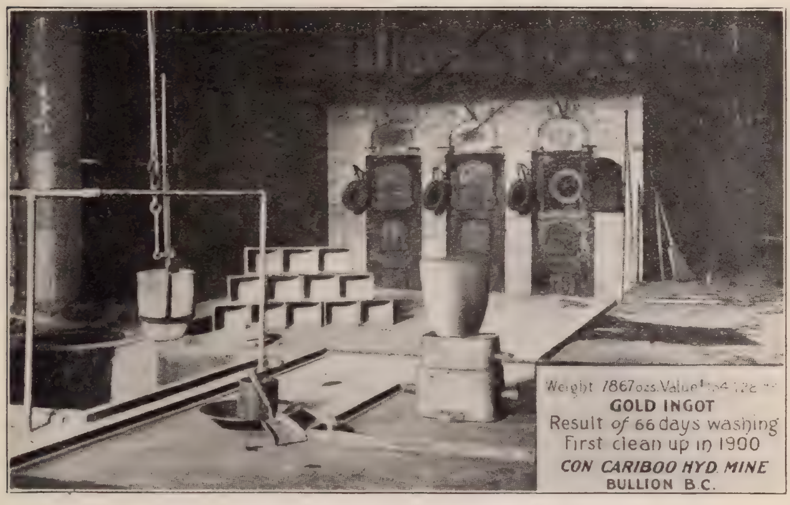
A TRIP TO ONWARD RANCH.

The Onward Ranch was thirty-two miles from Fairview, and one morning the entire family tumbled into rigs and had a delightful drive to the Onward. This ranch is in one of the most beautiful valleys I saw in British Columbia. There are more than a dozen buildings on the place, which gives it the appearance of a small village, and here we spent some very happy days. A stream runs past the buildings with some fine specimens of rainbow trout in it, and I added considerably to my reputation as an angler while at the Onward. Game of all sorts is abundant in this locality—blue grouse, pheasants and prairie chicken flying up at every turn. George came in one day with a grouse in his hand, and when reminded that the shooting season was not yet on he answered that he had not shot it. As a matter of fact, he had killed it with a stone beside the road, which did not prevent us from enjoying it at table the next meal. The flesh of the blue grouse is delicious and reminds me much of quail. Wouldn't I give a good deal to be at the Onward in shooting season!

One Sunday morning a Mr. Duffy, who was working on the government road about a mile above the ranch, brought us down the hind-quarter of a bear he had shot the night before. It was a young grizzly, about a year old, and we had our first taste of bear meat for Sunday dinner. If we had not known it was bear we might easily have passed it for some kind of domestic meat—probably a cross between mutton and pork. Mr. Duffy's description of shooting the bear was worth relating if there was space, but I must hurry on.

The House at Onward Ranch.

One day we drove to Jones' lake for fishing, and there I *did* catch trout. It was the rarest fishing I ever had. On the way back we went to the 150 Mile House—which means 150 miles from Ashcroft—where Mr. Gibson, the manager of the Cariboo Trading Company has his headquarters. Mr. Gibson showed us—in addition to the rarest kind of courtesy—some beautiful specimens of gold from the various mines up country, which were exceedingly interesting. There were a couple of nuggets heavy enough and jagged enough to cut a hole through a chamois gold bag in short order. His house is decorated with bear skins, lynx skins and other trophies of his gun, and a tame coyote was running in the yard—to the great delight of the children.



Gold Ingot.

We were sorry to leave the Onward, but I had already exceeded my proposed stay in the ranch country and must face the inevitable. So we drove back to Fairview, and one fine morning, after a day or two of rest, Uncle John brought out the team to the Studebaker, we said our good-bys and were headed once more for Ashcroft. I shall never forget my sensations on leaving this spot. There are oases of green here and there in the hardest life, there are heights of joy in the happiest, but it is seldom that the god of chance gives to mortal man that perfect surcease of care which is without alloy, or permits the sun to shine without a shadow. If I ever enjoy myself again as I did at Alkali lake and the Onward ranch, I shall consider that the fates have been exceedingly kind and have singled me out for their especial favor.

FROM ALKALI TO ASHCROFT.

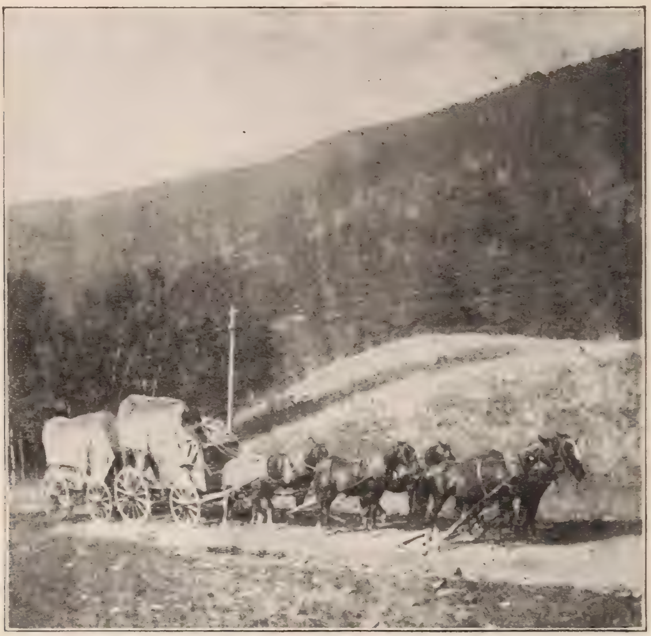
We are to drive back part way over a different route from the one we came by, and the first day we skirt along the mountains above the Fraser river, getting some splendid views. At noon we reach Dog Creek for dinner, and as if we were not yet to be let out of the region without fresh sensations, we were treated to the spectacle of a little girl, thirteen years of age, driving a team of colts less than one year old, broken and trained by herself and as perfectly under control as aged horses. After she had driven them about in a little harness made specially for them, she tossed on a couple of saddles and she and The Collector went off up the trail for a horseback ride, the tiny baby colts behaving perfectly. The name of this little girl is Annie Place, and she has The Collector's thanks for a very happy half hour.

The Collector and Annie Place Riding Baby Colts Not a Year Old, Dog Creek, British Columbia.

We have a steady climb up a mountain for several miles from Dog Creek, and then drive most of the afternoon across a table land of timber and prairie, coming toward evening to the brow of the biggest mountain we had yet faced. To attempt to drive down that mountain seemed sheer lunacy. Even Uncle John had promised us a sensation here, and we had heard all along the line about Canoe Creek Mountain. The Mater was for getting out and walking down, but was laughingly assured that she was much safer in the wagon. And now we saw another unique expedient of the mountaineers. Uncle John had bought an axe at Dog Creek, and as we reached the top of Canoe Creek Mountain he cut some tall, bushy trees and tied them with a "lass" rope to the hind axle of the wagon—the tops of the trees looking toward the wagon. I volunteered the information to the Mater that this was to keep the hind end of the wagon from tipping over the horse's heads, but as a matter of fact, this sort of drag helps wonderfully in mountain descent. And surely we needed it going down this one. Uncle John braced his foot against the brake, took a tighter grip on the lines, and pulled out the whip. Why will drivers use a whip in going down mountains?—but I have already told why. I am tired describing sensations on this trip and am sure my readers are tired of them, too, so I will merely say that we reached the bottom safely, where we saw on either side of the road scores of trees scattered along, having been dumped there after helping other wayfarers down the mountain.

We started next morning up Canoe Creek canyon. Here the rocky bluffs in some places hang out over the wagon road, and the scenery is being continually varied. From this on till we reach Ashcroft, the third day out, we are going through much the same country we saw on our trip up. There are lakes by the score and on every lake we see hundreds of ducks and sometimes geese. At one place a flock of geese were quietly feeding near the water, and though we drove well within shooting distance, they scorned to rise. We saw so many wild waterfowl during our trip up country that they are entirely beyond computation. I do not believe in all my previous life I have seen so many ducks. Over on the other side of one lake we saw a lone coyote sitting beside the water, and almost the color of the gray bank.

When we struck the Cariboo road we began to meet freight teams hauling supplies to the mines and ranches. They have from six horses upward, and on one wagon we met there were about 16,000 pounds of freight. It will thus be seen that the roads must be kept in good condition, and they assuredly are. I never was in any country where the government took such excellent care of the wagon roads as in British Columbia.



Freight Team Going Up the Cariboo Road, British Columbia.

The impression that this country leaves on the visitor is that it is an exceedingly easy place in which to obtain a livelihood. The valleys are fertile, the ranges extensive, and cattle, if properly managed, soon grow into money. Of course, the land must be irrigated in order to raise crops. Then, nature has been very lavish in her provisions. As I have intimated, there is abundance of fish and game of all kinds, from ducks, geese, grouse and rabbits to deer, bear and Rocky Mountain sheep. I saw some fine specimens of the justly famed Bighorn heads in the ranchers' homes. The people are generous and most hospitable, and the stopping places through the country for the most part good. Speaking of stopping places reminds me of an amusing incident at one of them. We had some salt pork on which the rind had been left, and the butcher had not been overscrupulous in removing the bristles. This was a new revelation to The Collector, who shot a quick glance at the Mater, and surreptitiously pushed the pork to one side of her plate. I afterward found in her note book the laconic entry: "At Mr. Blank's we had pork with the whiskers on."

Two things in riding over the ranges or along the wagon roads constantly catch the eye—bleached bones and empty bottles. The former speak of the tragedies of animal life, whereby some luckless horse or cow has fallen by the wayside and given up its carcass to the coyotes or crows, while the latter speak no less eloquently of what has become the real human tragedy of British Columbia—the traffic in whisky. This is written in no canting tone of temperance, but the fact remains that excessive drinking is the greatest curse upon the commonwealth. It is addling the brains of the rising generation and ruining some of the brightest intellects in the Province. The government prohibits the sale of liquor to the Indians, but of course the Indians get it and the result is not conducive to their higher civilization nor to the peace of mind of the citizens.

We returned to Ashcroft in just three weeks from the time we left, and that night shortly after midnight we took the Imperial Limited east-bound on the C. P. R. for a trip through the Canadian Rockies.

(To be continued.)

BOOK REVIEWS.

TRANSACTIONS OF THE FOURTH INTERNATIONAL DENTAL CONGRESS, VOLUME III.

This volume completes the published transactions of the Congress, and the entire work as represented in the three volumes adds very materially to the permanent literature of dentistry. It embodies the best thought of the profession to date, and will bear a careful study on the part of the profession. The editorial work has been most perfectly performed and the publication committee is entitled to the thanks of the members of the congress and the profession at large.

THE WORLD'S ANATOMISTS.

By G. W. H. Kemper, M. D., with eleven illustrations. Price, 50 cents. Published by P. Blakiston's Son & Co., Philadelphia, Pa.

This work contains the concise biographies of anatomic masters from 300 B. C. to the present time. It comprises the names of two hundred and twenty-nine anatomists together with sixteen authors of works on anatomy. It is a most captivating little volume of seventy-nine pages, and will prove of great interest to all those associated with anatomical work.

DOMESTIC CORRESPONDENCE.

NEW YORK LETTER.

The Central Dental Association of Northern New Jersey made quite an innovation on the occasion of its annual meeting and banquet on the evening of February 19th, which was the anniversary of its incorporation.

Instead of holding this meeting in Newark, N. J., as usual, the dinner was given at the New York Athletic Club.

After an enjoyable banquet the president, T. Starr Dunning, of Paterson, N. J., made a brief address of welcome, and introduced Dr. R. M. Sanger, of Orange, N. J., as "Professor Smooth," to officiate as toastmaster. Dr. Sanger, after making his acknowledgements, introduced William Wallace Walker, of New York, to respond to the toast, "The Milk of Human Kindness in the Dental Profession."

Dr. Walker eulogized the C. D. A. and all Jersey men, referred to the fact that Salt Lake City, Missouri, Maine and other states were represented. Answering his own question as to why these meetings were so popular, he said it was because the milk of human kindness was flowing through the veins of every man—rank and file—belonging to this society. He referred to the fact that Dr. C. S. Stockton, who was present a little over a year ago, could not be here and offered a toast to Dr. Stockton, which was drunk standing.

Dr. H. W. Campbell, president of the National Association of Dental Examiners, was the next speaker. His toast was "The Relations of the Dental Profession to the Examiners' Association and to the Faculties' Association." He thought that they had accomplished a great deal; that they had become a terror to certain dental colleges; that they held in hand the entire educational matters of the fifty-two colleges in the dental association.

Dr. William Carr, of New York, followed, speaking especially in regard to a national board of regents and on the subject of "Reciprocity."

The next post-prander was Dr. Ottolengui, editor of "Items of Interest," his subject being "What the Dental Editor Thinks." He spoke at some length opposing the claims of both the National Examiners' Society and the Faculties Society. He said he would not be a member of either because he wanted to be independent; he said that there are many things which might have been done by these associations that have not been done. Asked the question referring to the National Board of Dental Examiners, "What has it done to protect the community against incompetency?" said there was just as much reason to examine the examiners as for them to tell the faculties what colleges they should admit. Referred to a certain bill in Congress concerning contract dental surgeons; spoke of Dr. John S. Marshall giving up a lucrative practice and taking a position under the army and navy bill for less income because of his interest in that bill. Said that this new bill was so worded that Dr. Marshall and others would not be eligible for advancement. Asked that no bill be passed that would prevent Dr. John S. Marshall from being advanced in military rank. The audience, while applauding Dr. Ottolengui's sentiments to a great extent, did not seem to comprehend the seriousness of the matter as far as Dr. Marshall is concerned, and apparently were not as interested in it as it would seem the average dentist ought to be.

The next speaker was Dr. Thomas J. Barrett, of Worcester, Mass., his subject being "The Local Society as a Post-Graduate Course to the Dentist." Dr. Barrett proceeded to reply to Dr. Ottolengui's strictures on "The Examiners' and Faculties' Associations" before taking up his toast. Said that it had not been a pleasant thing to listen to this arraignment and did not agree with Dr. Ottolengui. Following this he went on to show how much value the local society becomes to the thoughtful student.

Dr. Burton Lee Thorpe, of St. Louis, responded to the toast, "The Man and the Hour." He said that the success of a society should not depend on one but that usually only a few do the work and some one must bear the brunt. Said that those who can not contribute, should at least attend meetings, as presence always counts. A good listener is rare. Away with the man who works only for money. Dental society work is a pleasure and a recreation. He does not like men with buttermilk in their veins.

The New York Institute of Dental Technique held its regular meeting for February at the Hotel Chelsea with President Hoblitzell in the chair.

The paper was presented by Dr. H. Clay Ferris, of Brooklyn, entitled "The Technique in a Dental Practice." The paper described the experience and education of an imaginary patient, in his visits to a dental office and of his treatment in a professional and business manner. Then followed a description of an office where everything was done by a gong; where the assistant dressed in nurse's uniform attended to all the preliminary business, where the assistant made an examination of the mouth after having sprayed the mouth and teeth with camphenol, electrically heated to a temperature of ninety degrees. The young lady secretary then appears with a diagram of the teeth; she makes an appointment and presents a steel engraved card. It appears that while the examination has been taking place the young lady has looked up the patient's rating in the Blue Book. If that is in good standing the patient is treated accordingly; if not in good standing his financial record is further looked up and if not satisfactory a request for payment for professional services is requested.

Then follows a description of the doctor's office; the care with which everything was prepared, the use of sterilized linen, the cleansing of the glass with ammonia and alcohol, the dentist cleansing his hands with a sterilized brush and a liquid soap.

After that came a description of how the doctor had looked up the financial rating of the patient, and of how he would have treated him had he been other than first class; of how he had frequently handled "dead beats" satisfactorily when the case was worth bothering with.

After this he gave a description of the work performed by the dentist; first the hygienic treatment; then a massaging of the gums with a paste, the formula of which was given. That seemed to occupy the entire time of the first visit.

On the next visit a tooth was prepared to receive a crown. Then follows the minute description of how the laboratory work should be conducted. The rest of the paper carried out the idea as suggested by what we have already given—of the strictly commercial aspect of our profession.

The discussion was opened by Dr. Henry W. Gillette, of New York, who spoke in general terms on the advisability of conducting one's practice on a strictly business basis.

Dr. F. C. Brush in his discussion of the subject lamented the deplorable fact that the practice of dentistry is generally conducted without any thought of a systematic business method. He said it is principles and not prices that we are after, that every man must make his own fees but that there are simple business principles upon which he may base his fees and these principles must be applicable to every practice. He spoke of the model that Dr. Ferris had given as being a very high standard.

1851—1906 was all one would see on opening the invitation to a "Complimentary Dinner to Dr. Henry A. Hull in Commemoration of Fifty-five Years' Practice in the Dental Profession," except an exceedingly good picture of the "Hull" thing which adorned the outside of the (apparently) extensive program, etc.

Further investigation of the program, invitation, or what you will, revealed the following: On first inside page was an elaborate "announcement" of the fact that this dinner was to occur at the Hotel Brevoort, Eighth street and Fifth avenue, New York City, on the evening of March 10, 1906, in commemoration of fifty-five years' continuous practice in the dental profession, by Dr. Henry A. Hull, of New Brunswick, N. J. As Dr. Hull has been treasurer of the New Jersey State Dental Society for years, and is well beloved by all, as well as "being well known in and about the apartments of the Temple," it is readily seen that he was a "star attraction." A large number of his friends and associates gathered to honor him, and after enjoying the banquet provided by mine host of the Brevoort, settled back in their chairs while Toastmaster Benjamin Franklin Luckey, D. D. S., of Paterson, N. J., proceeded to "set the ball in motion." The space for toasts was vacant save the heading "About the Man and Something Else Which Comes Handy." With rare perception of the fitness of things Dr. Luckey called on one after another of those whom he thought best to speak—and made the evening very enjoyable. Each speaker knew Dr. Hull well and was able to speak "of the man," and add a little something handy. During the evening Dr. W. W. Walker on behalf of the friends assembled presented a fine liquor cabinet to the doctor.

The front page of the program was embellished with a most excellent photo-gravure of Dr. Hull. Letters regretting inability to be present and joining in plaudits for the guest of the evening were read from Drs. C. S. Stockton, of Newark, N. J., S. G. Perry, of New York, William Jarvie, of Brooklyn, E. T. Darbey, of Philadelphia, B. Holly Smith, of Baltimore, W. G. Chase, of Princeton, N. J., John I. Hart, of New York, and R. Ottolengui, of New York.

Dr. A. L. Northrup, of New York, was the first speaker, as "one of the boys." He was followed by the guest of the evening, who briefly sketched, especially, his early life. He came to New York when there were no dentists above Bond street. Described his early experiences; his service in the Union army during the Civil war, and his going to New Brunswick, N. J., with Dr. A. D. Newell, from which time he has been closely identified with dentistry in New Jersey. The other speakers were Drs. W. W. Walker, of New York, H. S. Sutphen, of Newark, N. J., C. A. Tinne, of Berlin, Germany, R. M. Sanger, of Orange, N. J., J. Bond Littig, of New York, F. C. Barlow, of Jersey City, N. J., James G. Palmer, of New York, and Charles A. Meeker, of Newark, N. J.

It was a very enjoyable affair.

The regular meeting of the "Institute of Stomatology" of New York City for March occurred on the 6th inst. at the Hotel Chelsea in West Twenty-third street at 4:45 in the afternoon. Dr. Hector Griswold, of Salt Lake City, read a paper on "Pyorrhœa Alveolaris" at a *special meeting.* The doctor did not present any specially new ideas—mainly emphasizing the necessity for cleanliness, etc. In the brief discussion which followed Dr. James Truman, of Philadelphia, took an active part. He endeavored to point out the fact that in many cases of this disorder there *is* plainly a systemic condition which must be considered. That there were many cases when *no* deposit of tartar was to be found, and when the ordinary procedure would avail nothing.

At the regular evening meeting which followed, Dr. J. Morgan Howe presented models "before and after" of a case where deficient occlusion had been remedied by building up some of the teeth with metal tips nicely adapted to tooth and occlusion.

Following him came as the essayist of the evening, Dr. James Truman, of Philadelphia, whose subject was: "The Rise and Fall of National Dental Organizations." Dr. Truman went back to the "beginning of things," as far as dental organizations in this country are concerned—leading up gradually to the present state of affairs.

It was a paper replete with information regarding all our various attempts at national organizations.

In the beginning the claim was made that the destructive agency which had undermined the several national organizations, was the methods adopted in admitting to membership.

Dr. Truman also held that the source of all national organizations should be the local associations and inveighed against the action of the National at Buffalo in restricting it to state societies. He did not think the present national dental association would live long.

His paper was lengthy, as it could scarcely help being, and admirably covered the history of our national dental organizations, while loudly calling for an elevation of ideals and the forming of a *truly* scientific national body.

In the discussion very able letters were read from Drs. W. H. Potter and E. C. Briggs, of Boston, commendatory of Dr. Truman's position, but more or less agreeing that politics could not, and perhaps should not, be eliminated. One of the great desires which Dr. Truman and others are working for is the entire elimination of the political element. It was refreshing to listen to these letters from the "Hub" in which "politics" was not looked upon as an unmitigated evil.

Dr. B. Holly Smith was first to open the discussion. He received an enthusiastic welcome. In his discussion, while he did not array himself as against Dr. Truman, he made a most impassioned plea for the national organization, and strongly urged the members of the institute to join with himself and others in correcting errors, rather than standing aloof to point them out.

Dr. E. A. Bogue in further discussion drew on "hearsay" frequently, apologizing because he was "on the other side" during the summer. By reason of this reliance on "hearsay" he was set right several times by Dr. Holly Smith.

Dr. Herbert L. Wheeler spoke quite in line with Dr. Truman, and strongly against the action of the National in refusing to accept delegates from any but state societies.

At the February meeting of the Odontological Society, Tuesday, the 20th. Dr. A. DeWitt Gritman, assistant professor of prosthetic dentistry, Dental Department, University of Pennsylvania, read a paper and showed some lantern slides on "The Regeneration of Prosthetic Dentistry."

He recounted the history of prosthesis from about 1800 to 1853 and referred to vulcanite as sinking the art of that department of dentistry. That came in about 1858.

Subsequently there was a committee appointed to investigate rubber, the members of which were Buckingham, Wildman and Lineman.

Rubber vulcanized over a plaster model is very liable to cause disastrous results, but if the model be first covered with tin foil no irritation will follow.

The slides shown were "before and after" results of artificial denture resorations and truly demonstrated extremely gratifying results.

Dr. Griswold, of Salt Lake City, happened to be present. The chairman, Dr. VanWoert, accorded him the privilege of the floor. He made the assertion that 40 per cent of all people fifty years and over must wear artificial dentures. Dr. Griswold spoke to some length on the difficulty of restoring the features and usefulness of the jaws in many instances. Too few men know how to correct the deformities. Dentistry (that part) should be made a specialty. His contention is that a man can be quickly taught to make a crown or bridge, but it takes a long while to know how to make an artificial denture.

Dr. Littig in speaking of the problem of restoration said it was a question whether the patient after losing the teeth could stand restoration that would bring the features back to the normal. Often they will not.

The matter of hypertrophy of the soft parts, due to loose plates, came up for discussion. Dr. Littig said that operative procedure was not necessary in these cases, in fact the mouth did better without causing a cicatrix. The denture should be made, ignoring the folds and nature would take care of the rest.

Your correspondent attests to the propriety of that from personal knowledge and practice in two severe cases.

Dr. John H. Meyer also pulled Dr. Gritman asunder some. He said the beautiful articulation was all right in nature, but all wrong out of it; when making dentures for people forty years or over, the first thing he does is to grind off all cusps. As to the curve in molar region, that is all a myth. You can get no good results from it. Everything must be on the level.

Dr. LeRoy reiterated the time-worn "get a good impression," but he went further by saying that it is impracticable to get a good impression for full (edentulous) cases with the present form of impression cup. When the operator attempts to exert the pressure upward and backward as we have been taught, with the finger at one point in the roof of the mouth, the finger glides down the inclined plane. The result is constantly changing pressure while the impression material is hardening, with consequent results. He recommends an addition to the cup or a change in its form, both upper and lower, to obviate this.

Dr. William Jarvie told us that it was his privilege to be in the office with W. W. Cotton (the famous) from 1859 to 1863 (between his eighteenth and twenty-second years) when all teeth were carved by hand. He also exhibited some of his handiwork of years ago.

The salient points of Dr. Gritman's closing remarks were that good vulcanite plates can not be obtained vulcanizing at 320°. He vulcanizes at 280° for three hours. We try to hasten the process by heating too high for too short a time.

He feels that prosthetic dentistry is the greatest department of dentistry. When all else is gone *it* will remain.

Some of the friends of Dr. A. L. Northrop, wishing to show their esteem and affection for him as a man and their regard and appreciation of him as a dentist throughout a long, successful and honorable career, tendered to him a complimentary dinner at Delmonico's on Saturday evening, February 24th. Your correspondent could not attend, but has heard that the event was fully as auspicious as Dr. Northrop's friends could hope for. There were ninety or more assembled to pay homage to the illustrious character.

It is with much regret that we are not able to give a more detailed account of the event.

The regular monthly meeting of the Second Dental Society took place at the Kings County Medical Society's Library building in Brooklyn on Monday, March 12. Matthew H. Cryer, D. D. S., M. D., of Philadelphia, was presented to the assemblage as the essayist, by the chairman, Dr. Gould.

The title of the paper was "Alveolar Abscess from an Anatomical Standpoint," which was illustrated by stereopticon slides.

We get so little real anatomical work at our meetings that when we are favored it is truly enjoyable. Dr. Cryer is so thoroughly acquainted with his subject that he is always interesting and although he did not elucidate anything very startling, it was an instructive evening, punctuated by the exhibition of the slides.

The main theme seemed to be the possibility of danger to life or permanent discomfort or disfigurement due to infection following alveolar abscess. The doctor laid stress upon the cautious use of peroxide of hydrogen in closed cavities, saying that many cases of infection have obtained through its use in this way, inducing instead of limiting or reducing septicemia.

Dr. Cryer said there could be no fixed rule for the treatment of these cases, each one being a law unto itself, even in the mouth of the same person.

Brooklyn's most eminent dental surgeon—and if the gentleman lived in any other town I would be inclined to say the same of him—was present. He was requested to open the discussion of Dr. Cryer's paper. The person is Dr. C. B. Parker. He, too, sounded a warning against the use of peroxide of hydrogen. Speaking further of alveolar abscess he said if pain suddenly subsides and recurs again soon it is pretty surely a case of infection. The treatment is much the same as for abscesses in other parts of the body; first remove all infected tissue and establish proper drainage, then stimulate by remedies.

Dr. F. T. Van Woert, dwelling upon peroxide, said it was far from being a safe remedy and then recalled that many years ago a simple case of alveolar abscess became a severe necrotic case with the loss of most of the bone on one side of the face through its use without proper drainage. He said that the only exception he had to lodge against Dr. Cryer's paper is that he did not state what other drug or remedies to use in place of peroxide of hydrogen.

Dr. Russell asked: "Do many abscesses occur in the antrum from the teeth?" His practice is to extract teeth that have been discharging for more than two weeks. "We try to save too many teeth."

A communication was read from Dr. Kirk. He said that there were two kinds of conservation—true and false. Another warning was included against the use of pyrozone.

Dr. G. Lenox Curtis dwelt some on the use of peroxide for washing out dislodged tissue and debris in his operations. Subsequently he uses saline solutions and electrozone. His claim is that there is a great deal of antrum trouble due not to the fact that the roots of teeth have perforated into that cavity, but to diseased teeth whose roots are separated from the antrum by mucous membrane or a thin plate of bone also; infection takes places in these cases through a seeping of ptomaines through this membrane.

Dr. LeRoy said that we must not forget too that pyrozone should be used only as a first remedy as a cleansing dressing following an operation. To use it daily means positive destruction to granular tissue seriously retarding repair of tissue and probably inducing the trouble.

Dr. Cryer had used the term pre-molar in his paper. Dr. Van Woert was not sure what he meant by the term. Dr. Cryer said that he had been taught by comparative antomists to call the bicuspid teeth by that name, and he thought the same a good one.

THE BOROUGHS.

PRACTICAL HINTS DEPARTMENT.

EDITED BY G. W. JOHNSON, D. D. S.

[This department is for busy readers. We want short articles containing practical ideas—the shorter the better. No article must exceed 200 words, unless of exceptional merit. Every dentist has some useful hint that has been of value to him, and if he will only put it in print it may be of equal value to others. That is what this department is for. Due credit will be given for every article sent. Address G. W. Johnson, THE DENTAL REVIEW, 55 State street, Chicago, Ill.]

Utilize Your Worn Mandrels:—When a mandrel has been used for some time and will no longer hold a disc firmly, instead of discarding it as so many of us do, place a carborundum stone on it and in time we will have a good assortment of stones ready for instant use, and it will save both time and money.—*J. E. Cummings, Chicago.*

Pyorrhea is Hereditary:—Judging from my clinical experience I am convinced pyorrhea is hereditary and at its early stage amenable to treatment. After careful instrumentation in four-fifths of my cases, I have discovered serumal calculus by inserting a thin, narrow chisel through the gingival space on the proximal side of the roots.—*E. R. Carpenter, Chicago.*

First Permanent Molars:—There are eight teeth in the mouth I guard with jealous care: the first permanent molars and the cuspids. When the pulps of the first permanent molars are exposed and the child is under twelve years, I arrive at the question whether to treat them as temporary teeth and extract. I frequently remove one, but never yet consented to extract the other three.—*E. J. Perry, Chicago.*

Hygiene:—I believe that hygiene or prophylaxis is the most important subject today and is so considered by those who have to treat disease. The mouth being the great center of infection, if we can succeed in making it aseptic much will be accomplished in the prevention of disease. It is bad practice to treat disease of the stomach, nervous system, or any disease of the body, without attending to the condition of the mouth.—*T. W. Brophy, Chicago.*

Why Porcelain Changes Color in Fusing:—The changing of the color in the mass, to my mind, is due more to the movement in the molecules in the mass than it is to the burning out, and when the temperature is raised the molecules are changed and the coloring matter sinks or gravitates toward the center under high pressure. the tendency of the mass being to globulate. This is true of changes that take place in the inorganic world.—*G. W. Cook, Chicago.*

Collect Your Bills:—Patients who owe bills which are past due, if in need of further dental services will seldom go to the dentist whom they owe to have it done, even when they expect to pay for that particular work. But when they are forced to pay the old bill they are as likely to return for further work to the original dentist, as to go elsewhere; more likely, if the work has been satisfactory, and work which has been paid for is usually the most satisfactory.—*H. G. Logan, Aurora, Ill.*

Treatment of Patients:—We are well aware that the majority of patients enter the dentist's apartments with much fear and trembling, and he who can receive them in such a manner as to quiet their fears, which are often largely in their minds, by the time he is ready to begin the work, has taken a long step toward a successful operation, and in the building up of a practice such a one will be far more successful, though lacking in fine mechanical ability than he who, being the finest of mechanics, is devoid of such tact or ability to understand human nature.—*H. G. Logan, Aurora, Ill.*

Food Required:—A most interesting fact and one not generally known, is that the amount of food required depends largely upon the skin surface, as the object of taking food is to maintain animal heat, which is chiefly lost through the skin. A man weighing 180 pounds has a skin area of twenty-one square feet, while a child weighing ten pounds has a skin surface of three square feet, and needs only one-seventh of the food required by the man of 180 pounds. The man who perspires freely, whether working indoors or out, on account of the rapid evaporation through perspiration, requires more food than one who perspires very little.—*T. Elhanan Powell, Chicago.*

Successful Business Methods:—To make your business a successful one be systematic in everything you do—in your bookkeeping, in your records of services rendered; in fact, everything that pertains to your daily routine of work. Do not do things in a slip-shod manner. Be punctual. If you have certain hours for business—and you should have—be there; not fifteen minutes later, but exactly upon the dot. Make your appointments and be on hand to keep them.

Be a man alive to the best interests of the community in which you live. Be bright and cheery, greeting everybody with a pleasant smile. These, together with hard work and perseverance, will make your profession a most successful one and of which you may well feel proud.—*S. A. Helck, Grayville, Ill.*

Hygiene of the Mouth:—The human teeth are menaced in their integrity by two pathological principles—dental caries and pyorrhea alveolaris—whose origin is brought about by micro-organisms of the mouth. In view of these facts the profession at large are alive and awake to the importance of the subject. Colonies of bacteria grow in the mouth, aided by its warmth, pabulum, culture media. Practical observation will show that mechanical disturbances of the conditions favorable to bacteria in the mouth twice in twenty-four hours is sufficient to prevent any evil effects from their presence. Dentists should impart to their patients all the conditions arising that are favorable to disease and decay, and emphasize the necessity to look well to the hygiene of the mouth.—*J. W. Wassall, Chicago.*

Application of Arsenic:—Apply the rubber dam, dry the cavity, place the arsenic preparation in direct contact with the pulp, seal the cavity with any material that will absolutely insure the confinement of the arsenic, and allow it to remain in the tooth from four to six days. Upon the return of the patient apply the rubber dam, remove the arsenic, open up the pulp chamber, relieve the engorged blood vessels, and thoroughly dehydrate the pulp by use of absolute alcohol. Reseal the cavity and allow it to go ten days or two weeks or such an interval of time as will insure sloughing of the tissues. At the appointed time for the removal of the pulp, apply the dam as before and dehydrate with alcohol. By this process the pulp will lessen its caliber and toughen in its tissues and may be removed in its entirety with no hemorrhage or weeping of blood serum.—*J. G. Reid, Chicago.*

Fusing Porcelain:—The following deductions are from experiments:

1. That porcelain has no definite fusing point.

2. By prolonging the time of exposure to heat a thoroughly fused porcelain may be obtained at a comparatively low temperature.

3. That porcelains fused at a lower temperature for a long time will maintain their characteristic color.

4. That low-fusing porcelains can be made of high-fusing porcelains by repeated fusing and grinding.

5. If a piece of porcelain is thoroughly fused and more porcelain added and fused, the first layer will be slightly over-fused.

6. That porcelains containing a large percentage of flux are affected more by bubbles than those that are more nearly composed of the basal ingredients.—*J. Q. Byram, Indianapolis, Ind.*

Anesthesia:—Incomplete or partial anesthesia as a cause for accidents is usually brought about in this way: A patient comes into the office and wants a tooth extracted, but can not stand to be hurt. She wants to take just a little chloroform, not enough to put her to sleep, for then she might never wake up. She wants just enough so that she will not feel the tooth when it comes out. This simple and innocent sounding request, if complied with on our part, renders a trivial operation, that would not be at all dangerous if no anesthesia was used or complete narcosis attained, extremely dangerous under imperfect anesthesia. Now, if we put this patient under complete anesthesia, all reflex action will be abolished. But if anesthesia is incomplete or imperfect, the shock or pain from extracting a tooth may contract and arrest the heart action. At the same time the blood continues to flow into the dilated capillaries and veins, and the heart fails to maintain sufficient blood pressure to re-establish the normal arterial circulation.—*A. D. Kyner, Moweaqua, Ill.*

Send in Your Hints:—In a paper read before the Northern Illinois Dental Society at Elgin, October, 1905, Dr. A. C. Willman, Kankakee, Ill., under the caption "Helpful Hints," in his opening paragraph said: "Dentists are continually thinking of better and quicker ways of accomplishing results in our professional work. These little short cuts are greatly appreciated by the average practitioner, so much so that most of our dental journals now devote a few pages each month to them, and most of us read them before we do the papers and discussions."

This is true and we wish to call the attention of our readers to the sentiment. There are very few practitioners who are not making original research to a greater or less degree, and every dentist who imparts to his brother practitioners the results of his labors, either by a short article for a "hints" department in the dental journals, or by a paper read before a society, has added to the advancement of the profession. *Send in your Hints.*—EDITOR.

OBITUARY.

MR. HENRY M. LEWIS.

DIED: Friday, January 26, 1906, at his residence, Germantown, Pa., of pericarditis, HENRY MARTYN LEWIS, president of the S. S. White Dental Manufacturing Company, in the seventy-fifth year of his age.

The death of Mr. Lewis removed from the ranks of dental dealers one of the most noted and worthy men connected with the supply interests. To those who were fortunate enough to come into association with him he always gave the impression of being more than ordinarily a man of the most sterling worth. No one could ever imagine anything small or uncharitable connected with his personality. He was kindly, considerate, well-poised and altogether lovable. Such men are not numerous, but they wield a wondrous force in the affairs of the world—not ordinarily with a blare of trumpets, but in the quieter and further-reaching influence of the strength of their moral fibre, and in their tenacity to the purpose of always doing right.

To the dental world at large the death of Henry M. Lewis is a distinct loss, to his immediate associates in the company with which he was so long and honorabily identified, it comes as a profound bereavement.

DR. LUTHER W. SKIDMORE.

DIED: DR. L. W. SKIDMORE, of Moline, Ill., vice-president of the Illinois State Dental Society, died suddenly of heart failure on February 23, 1906. His death came as a shock to his many friends, who had always supposed him to be a vigorous healthy man.

Dr. Skidmore was born in Morris, Ill., June 2, 1863.

When nineteen years old, he entered the University of Philadelphia, Pennsylvania, and graduated two years later, in 1884. The following January, 1885, he commenced the practice of dentistry in Moline, Ill., and for twenty-one years maintained a reputation, and example, which is well worthy of following.

Dr. Skidmore was closely identified with the State Dental Society, the First District Society of Illinois, the Tri-City Dental Society and the Rock Island County Dental Society.

He was genial of disposition, kindly of heart, and ever ready to help his fellowmen, which won for him a large circle of friends. He was a member of the Doric Lodge, No. 319, of Masons, also of St. George Lodge of Knights of Pythias, and of the Modern Woodmen.

In respect to the memory of Dr. Skidmore, the Rock Island County Dental Society adopted the following resolutions February 27, 1906:

WHEREAS, The hand of Providence has removed from our midst our honored brother in the profession, Dr. L. W. Skidmore, and

WHEREAS, In his death we have lost one of our most active members, who until his death evinced a warm interest in the welfare of our association; and as a member of the various societies of the State he gave freely of his time and energy for their betterment and advancement; therefore, be it

Resolved, That we, the members of the Rock Island County Dental Society, desire and do express to his family our sympathy and sorrow in their affliction, and our admiration for the professional and personal qualities of our member; he was our friend, ever ready to extend a helping hand to a brother.

Resolved, That these resolutions be spread upon the records of our association; a copy be sent to the family of our departed brother, and others to the dental journals for publication.

W. T. MAGILL, *Chairman.*
W. G. HAY,
H. G. TRENT,
Committee.

MEMORANDA.

IOWA STATE DENTAL SOCIETY.

The forty-fourth annual meeting of the Iowa State Dental Society will be held at Des Moines May 1, 2 and 3, 1906. C. W. BRUNER, *Secretary.*

ILLINOIS STATE DENTAL SOCIETY.

The annual meeting of the Illinois State Dental Society will be held in Springfield May 8, 9, 10 and 11. An interesting program is being prepared.

ELGIN MAWHINNEY, *Secretary.*

THE KANSAS STATE DENTAL ASSOCIATION.

The next annual session of the Kansas State Dental Association will be held in Topeka, May 10, 11 and 12, 1906.

Dr. J. E. Nyman, of Chicago, Ill., and Dr. George Edwin Hunt, of Indianapolis, Ind., will be present as our guests.

All ethical dentists are cordially invited to attend.

F. O. Hetrick, *Secretary.*

ALUMNI ASSOCIATION OF ST. LOUIS DENTAL COLLEGE.

The Alumni Association of the St. Louis Dental College (formerly Marion Sims) will hold their annual clinic at the college building, Grand avenue and Caroline streets, Monday and Tuesday, May 7 and 8. Address all communications to Dr. G. B. Winter, Frisco building.

Dr. O. Hammer, *President.*
Dr. R. C. Butts, *Secretary.*

THE NATIONAL ASSOCIATION OF DENTAL EXAMINERS.

The twenty-fourth annual meeting will be held at Atlanta, Ga., September 14, 15 and 16, 1906. Arrangements are being perfected for those desiring a short ocean trip for reduced rates via the Clyde and Old Dominion steamship lines, notice of which will be given by circular later.

Charles A. Meeker, *Secretary and Treasurer.*

Newark, N. J.

MISSOURI STATE DENTAL ASSOCIATION.

The forty-first annual meeting of the Missouri State Dental Association will be held this year at Springfield, Mo., June 5, 6 and 7 inclusive.

An unusually interesting program is being arranged. A number of men eminent in the profession have signified their intention of being present, and the meeting promises to be the best in the history of the association.

All ethical dentists are cordially invited to be present.

Sam T. Bassett, *Corresponding Secretary.*

AMERICAN DENTAL SOCIETY OF EUROPE.

The next meeting of the American Dental Society of Europe will be held at Berlin, Germany, August 1, 2, 3 and 4, 1906. A most cordial invitation is extended to members of the profession to be present. An interesting program is already assured and it is hoped to make this one of the most interesting and largely attended meetings in the history of the society.

George O. Webster, Hon. Sec'y,
Pariser Platz, I., Berlin, Germany.

THE MISSISSIPPI DENTAL ASSOCIATION.

The thirteenth annual meeting of the Mississippi Dental Association will meet in Gulfport, June 6th, 7th and 8th.

All ethical practitioners of this and other States are cordially invited to attend. Every effort is being made to have this the largest and most profitable meeting ever held, and the pleasures of Gulfport, on the coast at this time of the year, is a feature in itself.

Reduced hotel accommodations and the usual reduced rates on all railroads will be obtained.

For complete details address the secretary. Yours truly,

E. DOUGLAS HOOD,
Secretary Mississippi Dental Association.

DENTAL SOCIETY STATE OF NEW YORK.

The thirty-eighth annual meeting of the above society will be held in Albany on the 11th and 12th of May, when the following program will be presented.

The President's Address, Dr. W. J. Turner.
Report of the Correspondent, Dr. Ellison Hillyer.
Report of Committee on Practice, Dr. E. Howard Babcock.
Report, Scientific Research, Dr. F. W. Low.
Essay, Dr. Edward C. Kirk, Philadelphia.
Essay, Dr. J. Q. Byram, Indianapolis, Ind.
Essay, Dr. H. A. Pullen, Buffalo, N. Y.
Essay, Dr. G. B. Mitchell, Buffalo, N. Y.
Essay, Dr. W. B. Dills, Brooklyn, N. Y., "Gold Inlay."

The sessions will be held in the Assembly hall of Hotel Ten Eyck and a very cordial invitation is extended to all reputable members of the profession to attend the meeting. Trunk Line Association rates on all railways.

CHARLES S. BUTLER, *Secretary,*
The Frontenac, Buffalo, N. Y.

RECENT PATENTS OF INTEREST TO DENTISTS.

810,611. Dental obtunder. Wesley F. Blasingame, Moultrie, Ga.
810,712. Artificial denture. John M. Card, Olean, N. Y.
810,713. Artificial denture. John M. Card, Olean, N. Y.
810,842. Artificial denture. John M. Card, Olean, N. Y.
811,370. Dental can, William Brush, Weehawken, N. J.
811,479. Dental compress. Nathan L. Burke, Benton Harbor, Mich.
810,954. Toothpick holder. Wilhelm Loewen, Glatz, Germany.
811,442. Dental and surgical lamp. Clarence F. Rodgers, Conneaut, Ohio.
811,848. Dental clamp. Edson L. Hutchinson, Honolulu, Hawaii.
811,849. Tooth separator. Edson L. Hutchinson, Honolulu, Hawaii.
811,864. Dental and surgical obtunder. Wiliam L. Moore and E. L. Hutchinson, Honolulu, Hawaii.
811,806. Mirror for surgical, dental and like uses. Robert Walker, Newark, N. J.
812,395. Portable dental furnace. Frederick S. Belyea, Brookline, Mass.
812,328. Dental matrix. William Crenshaw, Atlanta, Ga.
812,567. Dental instrument holder. James W. Ivory, Philadelphia, Pa.

Copies of above patents may be obtained for ten cents each by addressing John A. Saul, solicitor of patents, Fendal building, Washington, D. C.

ILLINOIS STATE BOARD OF DENTAL EXAMINERS.

The next regular meeting of the Illinois State Board of Dental Examiners for the examination of applicants for a license to practice dentistry in the State of Illinois will be held in Chicago at the Northwestern University Dental School, southeast corner of Lake and Dearborn streets, beginning Monday, June 4, at 9 a. m.

Applicants must be in possession of the following requirements in order to be eligible to take the examination: First, any person who has been engaged in the actual, legal and lawful practice of dentistry or dental surgery in some other State or country for five consecutive years just prior to application; or, second, is a graduate of and has a diploma from the faculty of a reputable dental college, school, or dental department of a reputable university; or, third, is a graduate of and has a diploma from the faculty of a reputable medical college or medical department of a reputable university, and possesses the necessary qualifications prescribed by the board.

Candidates will be furnished with proper blanks and such other information as is necessary upon application to the secretary. All applications must be filled with the secretary five days prior to the date of examination. The examination fee is twenty dollars ($20.00) with the additional fee of five dollars ($5.00) for a license.

Address all communications to J. G. REID, *Secretary,*
1204 Trude Building, Chicago, Ill.

A GREAT DENTAL CLINIC.

The Kansas City (Mo.) Dental Society has appointed a committee to arrange for a great dental clinic to be held February 22 and 23, 1907.

The committee is represented by Dr. J. P. Root as president and the following chairmen: J. D. Patterson, essays; F. G. Worthley, clinics; T. E. Purcell, exhibits; M. C. Carpenter, program; R. M. Siebel, arrangements; D. J. McMillen, reception; C. L. Hungerford, smoker; C. L. Van Fossen, finance; J. W. Hull, publication; F. W. Franklin, railroads.

The chairmen of the different committees have been at work, even at this early date, and have arranged for quarters at the Midland—having secured the large banquet hall for the clinics and enough other space for the exhibits, etc. Everything is being planned in a large way so as to make this greater than all former clinics.

The clinicians will be selected from among the most prominent men in their respective lines. One evening will be devoted to essays—limited to two in number—and will be given by men well known in scientific dentistry. A complimentary banquet will be given the clinicians and essayists by the local dentists.

The committeemen back of this undertaking realize its magnitude and expect to exercise the necessary energy to push it to a successful end. All ethical dentists and dental societies are requested to keep this date in mind and co-operate in making this a great dental gathering and the greatest of all practical dental clinics.

CARROLL'S
DENTAL CLAMP and MATRIX COMBINED

Patented July 26, 1904.

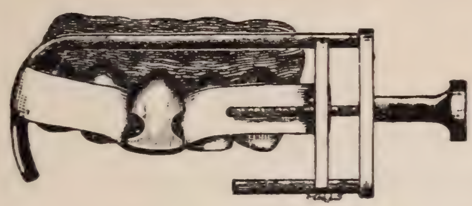


Fig. 1

For use in plastic and gold approximal and contour fillings of the anterior teeth, both upper and lower. It transforms the most difficult cavities into simple ones by flooring the lingual surface of the tooth with a metalic ribbon, the thickness of which is about 4-1000ths of an inch and which may be passed between teeth of rigid contact; after which, by turning the tension screw, the metalic ribbon may be brought to a tension sufficient to support all the pressure that is necessary in condensing a gold filling at the same time perfectly contouring the lingual and approximal surfaces of the gold. Fig. 1 shows front view of the clamp properly adjusted for a filling to be made from the labial surface. Fig. 2 shows a posterior view, when filling is to be inserted from the lingual surface.

This device, in the hands of an experienced dentist, saves time and labor, and saves the patient much pain; for when the metalic ribbon is brought to a tension it supports the tooth that is to be filled and unites the strength of three teeth in place of one, to resist the pressure and blows the mallet. In the hands of an unskilled operator, it enables him to make a good gold filling.

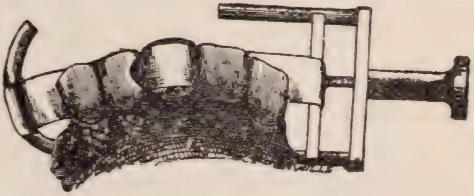
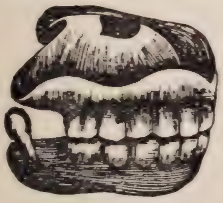


Fig. 2

Prices: $2.50 with 6 Ribbons; Extra Ribbons 50c. per dozen



CARROLL'S
RETAINERS
FOR
Artificial Teeth

Fig. 1 shows Retainer attached to the plate.

Fig. 2 shows Retainer before attachment.

Fig. 1

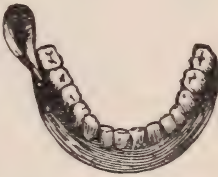
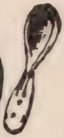


Fig. 2



(Patented September 17, 1895; in United States and Foreign Countries)

Retainers do what their name implies; they hold a lower plate firmly and steadily in position.

The muscles of the jaws and cheeks, in their contraction, exert a pressure on the expanded and vertically extending portions of the retainers. This pressure, which is exerted without conscious effort, is the force that holds the lower denture firmly in position on the alveolar ridge.

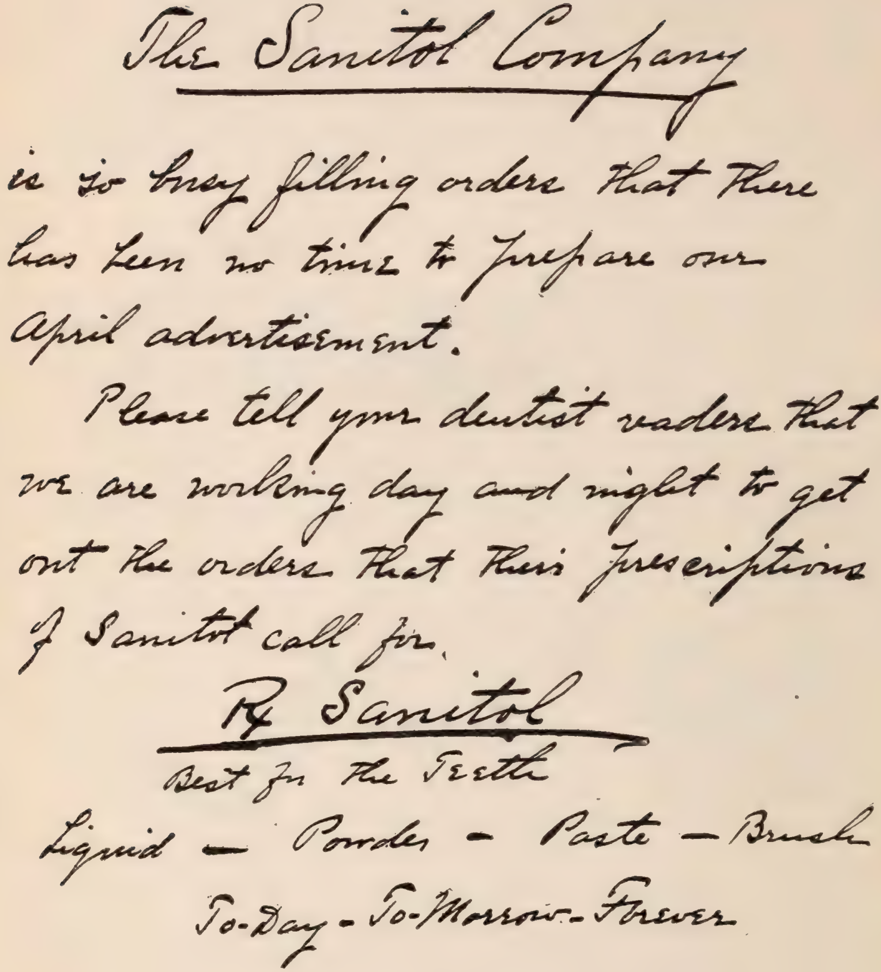
Retainers are made of Aluminum.

Prices: One Pair 75 Cents; Six Pairs $4.00

SOLD BY ALL FIRST-CLASS DENTAL DEPOTS

JOHN T. NOLDE DENTAL MFG. CO.,

916 Olive Street **ST. LOUIS, U. S. A.**



The Sanitol Company

is so busy filling orders that there has been no time to prepare our April advertisement.

Please tell your dentist readers that we are working day and night to get out the orders that their prescriptions of Sanitol call for.

℞ Sanitol

Best for the Teeth

Liquid — Powder — Paste — Brush

To-Day - To-Morrow - Forever

THE

DENTAL REVIEW.

Vol. XX. CHICAGO, MAY, 1906. No. 5.

A COMPARISON OF BEGINNING AND BURROWING CARIES.*

BY FREDERICK B. NOYES, D. D. S., CHICAGO, ILL.

The subject of my paper has been announced as "The Inception, Progress and Treatment of Caries." This is much too large a field to attempt to cover in a single evening, and I am therefore going to confine myself to a comparatively small portion of the subject, and attempt to make a comparison between the conditions presented and the treatment required by beginning as compared with burrowing decays.

I have been led to this partly by the criticisms of the doctrine of Extension for Prevention, originating largely in the East, namely, that it leads to an extravagant and unsightly display of gold. I hope to show that the extensive show of gold is the result of extension for strength, and extension for convenience, not extension for prevention.

The discussion of extension for prevention has led to a much closer study of the appearances and positions of beginning caries, and the directions of its superficial extension, and an evening might be spent on this topic.

In fact, extension for prevention in practice might be defined as a study of the positions and conditions of the superficial extensions of caries and excavation with reference to them. To successfully apply this rational treatment of caries has required modification of the detail of cavity formation, with reference to strength, retention, and access, a study of the means and manner of rapidly and perfectly condensing gold, and perfect and easy finishing of the filling in proper contour. One of the reasons that there has been so much opposition excited by the discussion of this subject is that all of these things have not been taken together, and bad results have followed the attempt to apply the principles without the necessary technical knowledge and skill to properly execute the work. In discussing the treatment of caries, therefore, it is not enough to decide upon the extent of excavation required, but manner of execution of the filling must be described so that the filling may be well enough adapted to the walls and sufficiently dense to exclude moisture, and can be inserted and finished in a reasonable amount of time.

---

* Read before the Minnesota State Dental Society, June 2, 1905.

In studying the picture, therefore, we will attempt to examine in detail the conditions of attack and extent of disintegration of tooth tissue shown in the case, the cavity preparation called for, and the manner of inserting the filling.

Caries of the teeth always begins in sheltered positions and these are divisable into two classes, each presenting characteristics of appearance and manner of progress which are important to be clearly understood and must be constantly borne in mind. These are caries in natural defects of the enamel, and caries on smooth surfaces.

Caries appears first in the depths of natural defects in the enamel, caused by imperfect closure of grooves, developmental lines and pits. In these positions the mouth of the groove or pit becomes choked with food debris or the products of microbic growth and the acids produced are confined in the depths of the natural defects.

The action on the tissue is therefore greatest in the deepest part of the defect and becomes less as the surface is approached from which the acids are rapidly removed by the saliva, and the surface kept clean and polished by friction. In these positions the disintegration of the enamel extends laterally, and toward the dentine, until the dento-enamel junction is reached, and then spreads rapidly in the dentine, undermining the enamel. In all stages of progress it presents a wider lateral extent in the deep portion of the enamel and dentine than upon the surface.

Decays beginning in natural defects are therefore burrowing decays almost from the start, and especially after the dento-enamel junction is reached the lateral extension is rapid and may be of any extent without showing on the surface.

In general terms, beginning decays may be classified as those in which the lateral extension in dentine is not yet greater than the superficial attack or extension in the enamel.

Burrowing decays are those in which otherwise sound enamel is undermined.

Upon the smooth surfaces of the enamel caries attacks the tissue at points which, for some reason or other, are sheltered from the natural friction of food in mastication.

The intensity of the attack will therefore depend upon several factors, some of which may be stated as the thickness of the colony, the nature of the zooglia formed, or, in other words, the toughness of the plaque, the rapidity of growth, which is one factor in the extent of surface attack from the point of greatest intensity; and the conditions which produce the shelter from friction, which are the most important factors in determining the extent of the areas of liability. In the attack upon smooth surfaces, Dr. Black pointed out very clearly, in a paper not long ago, that the conditions present two distinct tendencies: first, a tendency to penetrate the tissue, dissolving the cementing substance from between the enamel rods, and, later, the substance of the rods, until the tissue is penetrated and the dento-enamel junction is reached; second, a tendency to spread on the surface from a point of greatest intensity to areas of less and less intensity.

When the point of the penetrating cone reaches the dentine, that point still remains the point of greatest protection and, consequently, the point of greatest acid formation. This acid passes through the now porous enamel and so acts upon the dentine and affecting the contents of the dentinal tubules, causing the streaking of the dentine toward the pulp chamber, and often exciting reactions in the pulp tissue, and dissolving out the inorganic salts from the matrix. The destruction of the dentine follows the direction of the dentinal tubules and therefore spreads laterally, most rapidly at the dento-enamel junction, where the branching of the tubules is greatest. The form of progress in dentine is always conical with the base of the cone at the dento-enamel junction, except where the form of progress is modified by imperfect structure of the dentine.

The spread of caries in the dentine causes an undermining of the enamel, and the production of a cavity which furnishes an opportunity for the growth of microörganisms and the retention of their products, so that the enamel is attacked rapidly from the inside, producing the secondary decay of the enamel plate from within outward, which undermines the tissue much faster than the attack spreads upon the surface. If at that time the cavity is filled and the burrowing is stopped, the surface attack will again appear in the remaining area of liability. We very often find that the burrowing has extended in some directions, undermining and disintegrating the enamel much farther than the surface attack would be liable to spread. In preparing such a cavity the undermined enamel would have to be cut back to a greater extent than would be required for prevention. Such extension is extension for strength and not extension for prevention.

A few days ago a cavity in the mesial and occlusal surfaces of a second upper bicuspid was presented. Upon breaking the undermined enamel it was found that the decay had burrowed to the buccal and gingival, undermining the buccal plate so that nearly one-third of the buccal surface had to be cut away. This was not extension for prevention, for it left the cavity margin well around the angle on the buccal surface. On the lingual there had been little burrowing, and after the enamel had been cut back to sound dentine a well defined white streak could be seen extending from the linguo-gingival angle, showing that the surface attack was extending in that direction and requiring extension for prevention. The unsightliness of a gold filling in this cavity could not be charged to extension for prevention, but to neglect by the patient. If this cavity could have been treated as a beginning instead of a burrowing decay, buccal margins should have been left just to the mesial of the mesio-buccal angle and in a comparatively inconspicuous position.

Now, before taking up the pictures, I want to make as brief a statement as possible of some of the factors to be considered in determining the degree of extension, first, in beginning, and, second, in burrowing decays. To do this at all exhaustively would be too much of an undertaking for the present purpose, for the first topic involves a close study of all the conditions of caries. I assume, therefore, a familiarity with the conditions of caries and the areas of liability which have been described before and with which dentists should be familiar from their work from day to day, and I will simply mention the factors to be observed and considered. These factors I should class under two heads—first, general or systemic conditions, and, second, local conditions and local manifestations of conditions.

Every careful observer comes to recognize conditions which are still too indefinite and poorly understood to be capable of accurate statement, but by which he is led to the opinion that the patient in question manifests a peculiar liability to caries and that the disease will manifest extreme energy and persistence. In determining the extension required by beginning decays, this is the first factor to be carefully weighed, and it is the most difficult. It is to be hoped that some day microscopic and chemical examination of the saliva or other secretions may give us more tangible evidence on this point, but at present the determination of the relative systemic liability or immunity of the patient is very difficult and uncertain and remains a matter of instinct rather than judgment, and is based on the "ensemble" of the clinical picture, so to speak, rather than facts which can be stated. The heredity of the patient as expressed by the history of the parents with reference to caries should be considered, and especially any marked change in the conditions and manner of life, either by the patient as compared with the parents, or the present as compared with an earlier condition of the patient.

The local conditions are much more satisfactory to consider, as they admit of clear statement. They are, first, the form and relation of the teeth themselves. For all proximal cavities, the smaller the gingivo-occlusal dimension the greater the extension required. The smaller the difference between gingival and contact diameter, the greater the extension required, though this can be partly compensated for by separation. The broader the contact surfaces, regardless of other conditions, the greater the extension required. Second, the appearance of the attacked surface. Before excavating a beginning decay a medium fine strip should be drawn several times over the surface and the appearance carefully studied. The whiter the area of attack, the greater its intensity; it is, therefore, safe to judge that it has not reached its full extent of surface attack and extension must be carried beyond the farthest point of attack. If the lines of attack, extending from the point of greatest intensity, are brown or black, the extension may barely include them and be comparatively narrow. With reference to the degree of gingival extension, the age is a most important factor, as the areas of liability move to the gingival as age advances. This must specially be remembered with reference to gingival third cavities.

In the treatment of burrowing decay, the positions of the cavity walls is determined by the strength of the tissue rather than the continuance of surface attack. The general rule is briefly stated—the enamel must be cut back until supported upon sound dentine. But in addition to this very brief but very inclusive rule, there are a few areas of weakness that must be remembered in the preparation of such cavities. When the decay approaches developmental lines these must be cut out; this is of special importance when burrowing decay from proximal contact undermines the labial and lingual enamel plates close to the proximo-occlusal angles.

A good while ago I called attention to the weakness of the enamel wall where the burrowing of decay from an occlusal defect has destroyed the dentine under a cusp or marginal ridge. The enamel is thick and often appears strong, but the arrangement of the rods is such that a strong wall can be produced only by cutting away the tip of the cusp or ridge. The failure to do this causes the chipping of the enamel, which is so often seen in these positions.

I will now take up the pictures which have been made either from India ink drawings made directly from the teeth by Dr Black or are photographs that I have made from teeth and sections or cuts through areas of decay. These pictures are mostly still unpublished, but will appear before long, I hope, in Dr. Black's book.

In the pictures I will try to show beginning and burrowing decays in several positions and compare the treatment of each.

BETTER THERAPEUTIC EDUCATION OF DENTISTS.*

BY J. W. PENBERTHY, D. D. S., MINNEAPOLIS, MINN.

Education is certainly to be desired in all pursuits and the better education one has the better he is qualified to battle with the problems of life in an intelligent way.

I have chosen only one subject on which I trust the coming army of dentists may be better qualified, though there are many others just as important. I hope to offer a few suggestions that will cause us all to think deeper and to strive to fill the position which to my mind we are entitled. I speak of the coming dentist. Those of us who have been in practice for a number of years are, I trust, still in a receptive state.

The subject of my paper has been on my mind for a long time, but I have never put any of my thoughts on paper. My claims may seem rather broad, but I assure you they deal in no way in personalities.

The Encyclopedia Britannica says: "Therapeutics has been defined as a discovery of the means by which a system of forces competent to eliminate any given perturbation may be introduced into the economy."

Dentistry or odontology is extremely limited in the range of its subject matter, but it affords great opportunities for refinement and technical skill and is given up to a distinct branch of the profession.

Gould's dictionary gives the following definitions:

"Therapeutic—A method of diagnosis by administering certain remedies which are known to influence certain diseases."

"Therapeutics—That branch of medical science which considers the application of remedies as a means of cure."

"Therapeutist—One skilled in therapeutics."

Liffman: "The science of the application of remedies and of their effects."

Why we should be so limited in our range of subject matter is beyond my understanding and in view of the fact that so many diseases are amenable to certain remedies, I fail to see why men who have written so much for the general practitioner have not done more for us. Perhaps they think as Dr. Junkerman does, that the profession does not require much gray matter to practice it to the satisfaction of the public.

---

* Read before the Minnesota State Dental Association, June, 1905.

The practice of dentistry is unlimited and I claim that the height to which man may reach is so high that I fear he can never reach it, but may reach at least on a par with its sister, medicine. What was the practice of medicine in the past? The first step was to draw off life's blood to produce a cure and sear over the wound with a hot iron to arrest hemorrhage, etc. What is it today? The leading profession. Why? Simply because of the higher education and knowledge of the human economy and the better knowledge of drugs in the treatment of diseases. Medicine like dentistry deals entirely with the human economy and we have remedies which if properly given will produce just as marvelous results as in the practice of medicine. Many of the diseases which come under the eye of the dentist can and should be treated by him through the general system.

I claim that 90 per cent of the dentists in practice today are not qualified to prescribe for 2 per cent of the disorders met with in their daily practice, and few of them could give a list of the essential oils and how they are prepared, to say nothing of their effect on the tissues. A dentist will go to a drug store and call for carbolic acid and if asked what per cent will be at sea. If asked why he uses oil of cassia or cloves and what effect he expects to get, he will answer "stop tooth-ache or disinfect a canal." His preceptor used it, so does he.

These are a few instances I have met with which set me to thinking along this line. Our schools are to blame for much of this, and I hope the day is not far distant when we will see a radical change in the minds of our professors as to the importance of this branch, and when they send a man out with the D. D. S. or D. M. D. attached to his name, they will know that he has at least a well grounded education on the subject so that he may be able to prescribe for his patients intelligently. The man who has this education will soon be found out and the medical profession will open their arms to receive him and the public will show their appreciation of his ability and seek his services. Pardon me for using the pronoun "I." A short time ago a physician advised one of his patients to consult me on a very painful retarded lower third molar. I prescribed through her physician fluoric acid 3x every three hours and a few days ago I saw the patient and inquired as to the result. In the most pleased manner she replied, "It was fine, have had no trouble since." I mention this as only one proof of the benefit we can expect in many cases through the system. I do not wish to say a dentist should always prescribe, but if he has the knowledge of what to give let him, if he prefers, give his patient a note to his or her family physician, setting forth the line of treatment he would advise. There are some diseases I do not think it would be advisable for the dentist to treat, but he should have a knowledge of the disease and its treatment and send the sufferer to a physician.

Better education is being demanded in all walks of life, why not in ours? As we elevate ourselves so will the laity elevate us. If it is true, as some think, that the public do not demand anything better than they are getting, it is the fault of the profession and not the public. Our title, gentlemen, signifies our ability to teach and if the public are not aware of what our position and title gives us, let us by all means qualify ourselves to educate the public to that degree that they may know to whom to go in their hour of trouble. Certainly a better knowledge of therapeutics will not lessen a man's ability to fill teeth, make bridges or any other part of his work.

Dr. Van Duzee in his paper last year expressed in a few words what I feel along this line. "We have passed the point where the present conditions will suffice to accomplish the end." Again he asks, "Are you appalled at the magnitude of the task? Do you want to know who is going to pay the score?" There is no such thing as belonging to a profession that will stand still. We must either go upward and onward with the world or be left behind. It is not enough that we are being carried along with the crowd.

As I have said before, the medical profession has lifted herself on the higher rounds of the ladder and has done it by better education, and if we hope to elevate ourselves we must educate ourselves along the line that is very distinctly ours or forever remain where we are. This can not be.

I have not attempted to cover all the ground that is made possible on this subject, but trust you will get my thoughts and be able to enlarge upon them.

THE MINNESOTA STATE BOARD OF DENTAL EXAMINERS.*

BY C. H. ROBINSON, D. D. S., WABASHA, MINN.

Mr. President and Gentlemen of the Minnesota State Dental Association—Before taking up the subject of the State Board of Dental Examiners let us consider for a moment the dental law of our State. Our present law was enacted by the Legislature in 1889, but as most of you are aware the last Legislature passed a bill codifying the laws of the State, the new code to take effect in March, 1906.

Most of you are familiar with our present law. The code, however, differs somewhat from it. First, as to eligibility, the law of 1889 reads—"In order to be eligible for such examination such person shall present to said board his diploma from some dental college in good standing, and shall give satisfactory evidence of his rightful possession of the same, provided also that the board may, in its discretion, admit to examination such other persons as shall give satisfactory evidence of having been engaged in the practice of dentistry ten years prior to the date of passage of this act." The code reads—"A person not already a registered dentist of the State, desiring to practice dentistry therein, shall apply to the secretary of the board for examination and pay a fee of $10.00, which in no case shall be refunded. At the next regular meeting he shall present himself for examination and produce his diploma from some dental college of good standing, of which standing the board shall be the judges."

You will notice that the code makes no provision whatever for the non-graduate.

There is also a difference in the penalty and jurisdiction. The penalty of the present law is a fine of not less than $20.00 nor more than $100.00, or confinement in the county jail of not less than one month, or more than three months, or both fine and imprisonment. The jurisdiction is that of the district court.

The new code defines a violation of the dental law as a misdemeanor, the penalty of which is a fine not to exceed $100.00, or confinement not to exceed three months. The jurisdiction is that of justices of the peace and municipal judges.

---

* Read before the Minnesota State Dental Association, June, 1905.

For the benefit of the older members of the profession who have not taken our state board examination I will give a short description of the present manner of conducting an examination.

The candidate makes affidavit in his application to his age, name, academic and dental education, etc., etc. His diploma is inspected and he is given a number. He is known throughout the examination by this number, and also signs his papers with it instead of his name.

After the papers are marked the names and numbers are placed together.

The written examination is on the following subjects—Anatomy and histology, physiology, chemistry, materia medica and therapeutics, metallurgy, pathology and oral surgery, operative dentistry and orthodontia, and prosthetic dentistry. Each paper is marked on a basis of 100 points, making a total of 800 points for the theoretical examination.

The practical examination consists of preparing a cavity and making a gold filling, which is marked on a basis of 200 points being perfect.

So that altogether there are 1,000 points, out of which the successful applicant must receive at least 750.

Let me mention some of the problems which the board must consider from time to time.

First, what class of questions should be asked? How hard should they be and how closely confined to strictly dental questions?

For instance, in materia medica should the list of questions be confined to such drugs as are commonly found in a dental office? And if not, to what extent should it enter into the general practice of medicine?

In anatomy should nothing but the mouth be considered, or should the field be extended to include the head and neck, or the entire body?

Similar questions might be asked about the branches of physiology, chemistry, metallurgy and pathology.

Oral surgery is perhaps more sharply defined, but even here it is a question as to how deep to go into the general principles of surgery.

In operative dentistry, orthodontia, and prosthetic dentistry, strictly dental subjects, it is largely a question of merely how easy or hard to make the questions.

The law states that "the examination shall be elementary and practical in character, but sufficiently thorough to test the fitness of the candidate to practice dentistry," but no two men will interpret this exactly alike.

Our state board has usually assigned one or two branches to each of the five members and has allowed each of them to prepare the questions and mark the papers on his own branches. Each man naturally considers his subjects largely from his own experience and study, and from the teachings of his dental college. With the practical examination each member marks the prepared cavity, also the finished filling, and the markings are then averaged.

Another problem is the relation between the written and practical examination, 800 to 200, and whether or not the making of one gold filling is sufficient for the practical examination.

Then, too, there comes up the question of whether or not to make any allowance for the man who has been in active practice for a number of years, but who may be rather rusty in some of the branches which he studied in college and has used but little in practice.

This naturally brings up the subject of reciprocity between the different States, which is now being considered very seriously by the dental boards all over the country, and which in fact has been adopted by several of the eastern States.

The following resolution was adopted by the National Board of Examiners in August, 1903.

"Resolved, that an interchange of license to practice dentistry be, and is hereby recommended to be, granted by the various State Boards, on the following specific conditions."

"Any dentist who has been in legal practice for five years or more, and is a reputable dentist of good moral character, and who is desirous of making a change of residence into another State, may apply to the examining board of the State in which he resides, for a new certificate which shall attest to his moral character and professional attainments, and said certificate, if granted, shall be deposited with the examining board of the State in which he proposes to reside, and the said board in exchange therefor, may grant him a license to practice dentistry."

This is a matter of considerable importance to those who desire to move to some other State.

There is a great difference of opinion, and I believe some misapprehension about the duty of the board in prosecuting violators of the law. From letters received every once in a while by the secretary of the board there appears to be an impression in the minds of some members of the profession that the board should hire detectives, secure evidence against, and prosecute violators of the law, as soon as their names are reported.

I find nothing in the law making it the duty of the board to prosecute these cases, and furthermore the courts do not as a rule take kindly to the hired and paid for testimony of detectives.

However, the policy of the board has been in the past, and I believe will continue to be in the future, to assist as much as is within their power and means in seeing that the law is enforced. The best results are to be obtained where the local members of the profession are willing to take a firm, open stand in regard to this question, and not try to throw all the work and responsibility upon the board.

In closing let me state that I believe the members of the state board of dental examiners are working hard, and striving conscientiously to not only solve the problems here mentioned, but many others as well; that they are trying to discharge the duties of their office without fear or favor, and I bespeak for them the hearty support of every member of the profession in the State.

That mistakes have been made in the past, and will continue to be made in the future, is as certain as it is that men are human; and the chief object of this paper is to open a discussion that may result in benefit to the members of both the State Board and State Dental Association, so that through a better understanding they may work in more perfect harmony.

WHY AND HOW I FILL CHILDREN'S TEETH WITH GOLD.*

BY RODRIGUES OTTOLENGUI, M. D. S., NEW YORK.

Mr. President and Gentlemen—I am here tonight to bring you an extraordinary message, and the most extraordinary fact is that I should be here with such message. Yet it was at a meeting of this very society that I learned that such a message could be brought to Chicago with advantage to the children of Chicago. The wording of the message is brief, dogmatic, irrefutable, absolute:

Children's teeth should be filled with gold.

Every dentist who loves his profession, who loves his work, who loves children, should have that embroidered in gold letters by his sweetheart, be she wife or maid, and hung as motto in front of his operating chair lest he forget it. But those that really love children will need no broidered blazonry, for they will carry the axiom next to their hearts, and when dealing with children every throb of the love organ will cry out, "Do thy very best for this little one, for even as ye have done it unto the least of these, ye have done unto Me."

Such men do not plaster up the holes in children's teeth with asphalt, Portland or any other cement; neither do they sully these valuable young pearls with settings of black oxidizing metallic pastes, under the misapprehension that permanent work is thus rendered.

The idea of opening this discussion in Chicago first came to me in Chicago. When I had the honor of first reading a paper before this society, I had for my topic the consideration of extension for prevention. During the debate that followed one gentleman said: "I gather from the essayist's paper that he fills children's teeth with gold. How does he justify such work?" I was so astonished by the query that I was nearly struck speechless, but with my name, that would scarcely be a physiological possibility, and so I found a reply, which satisfied me at the moment, and which, strange to say, I have never been able in my mind to improve. The answer was:

"How can you justify any other procedure with children?"

Still, I was disturbed to find that what I had considered a long settled proposition could be questioned by eminent men. After all, might I not be wrong? The more I thought of this the more I worried over it. Had I for a quarter of a century been doing the worst rather than the best for my little ones?

---

* Read before the Chicago-Odontographic Society, January, 1906.

One evening a few professional friends gathered in my office and I started the discussion, and again, to my surprise, I met opposition. This stirred me to action, and I went before the New Jersey State Dental Society and outlined my method of dealing with the permanent teeth of children. The discussion which followed was lengthy, but unhesitatingly I say that no valid argument was brought out to refute my position. All that was proven against me was that it is not every man who can fill children's teeth with gold. But this I had long known. The field of dentistry has grown so large that no man may till the whole of it and reap a marketable harvest. Specialization is the only future hope. And so, having met with no logical disproof of my position in the East, I venture here, where the seed of the discussion was first sown, to thrash out the straw with you.

First, let me relate two incidents. Some months after the publication of my first paper, a prominent dentist of northern New York, a good friend of mine, called and spent the whole of a Saturday with me. It chanced to be a day of great variety. The earlier appointments were with my orthodontia patients. Then came a cleft palate child, and after her a girl, not yet 9, whose sixth year molars required attention. I had already placed four gold fillings in her upper molars. Calling my dental friend to the chair I pointed out a cavity in the right lower molar, and I said:

"You see, doctor, I have filled the upper teeth with gold, but when I argue for gold in children's teeth I presuppose conditions under which absolutely perfect work can be rendered. If, for any reason, this can not be done, the cavity should be properly prepared and filled with pink gutta percha. Now, in this case, the tooth is short, the distal cusps barely through the gums, and I fear it would be cruel to force a clamp on to hold the rubber as long as would be required to properly fill the tooth, and I consider a bad gold filling much worse than none, since it beguiles the patient into a fancied security which does not exist. Therefore, I will fill this cavity with gutta percha for a few months, and then insert the gold."

Interested in my argument, I had grown oblivious of my little patient, but she had listened intently, and here startled us both, as I reached my period, by remarking:

"Oh, go on; fill it with gold."

I was delighted; my friend astonished. I tried a clamp and found that it slipped to place better than I had supposed it might, the gum yielding nicely. I twisted a rope of cotton, saturated it in a weak cocaine solution, and packed it for a few minutes around the tooth. Then placed my clamp, slipped on the rubber dam, inserted the saliva elector and proceeded with all thoroughness to fill that tooth with gold. Every particle of caries was removed, every sulcus cut out to its farthest extremity, and the gold carefully and thoroughly condensed with my electric engine mallet. When finished the filling was quite as good, I assure you, as any of you could have made with amalgam. When my patient had gone I turned to my friend and just remarked, "Well?"

His answer was prompt and frank: "Ottolengui," said he, "I have always liked you, but when I read your paper about always filling children's teeth with gold I thought you were—well, lying. I am glad to have seen you handle that patient, and I withdraw the suspicion against you which I have held mentally."

The second incident was more recent. Early in last fall a lady called, accompanied by her daughter, a girl of 11. She stated that she had come for a consultation, primarily in regard to the regulation of the teeth, but also in respect to the filling of them. Examination disclosed four sixth year molars, in three of which were the remnants of oxyphosphate fillings. In the other there was a gold filling. She desired to know which dentist had been right, the man who had used the oxyphosphate or the man who had filled with gold. I gave her my reasons for the use of gold, and she then told me the history of the case. She is a woman of wealth; her husband is one of the very rich men of the country. Her dentists, therefore, were not limited by expense. Such patients have a right to expect the best, though, indeed, every patient is entitled to that. This child's teeth had been filled semi-annually with plastics for three years. Last summer, while at a summer resort, one tooth became sensitive and the child was taken to a dentist and came home with a gold filling. The mother was outraged. "Did not her New York dentist know what was right? Had he not told her repeatedly that her child's teeth were not strong enough for gold? That she was too young to have gold inserted; too nervous, too sensitive? Were there not a dozen reasons why gold should not have been inserted? And yet this man at a little summer resort had dared to fill the tooth with gold. She would see about it." And she sallied forth to that dentist and said things to him. He tried to explain to her, but she had the other man's argument pat. Then this dentist handed the woman a copy of the paper which I had written, advocating the use of gold for children's teeth, and asked her to take it home and read it. This she did, with the result that she called on me to have me tell it all to her again, face to face, and with the further result that the child was placed in my care, and for that child I have thus far replaced five plastic fillings with gold, and every one of them reached nearer to the pulp than ever should have been possible in the mouth of a child visiting a dentist at the call of the dentist, semi-annually, or oftener if need be. This work has so impressed the mother that just before leaving home I received a note asking for an appointment for herself, and there is no doubt that my advocacy of filling children's teeth with gold has brought within my care one of the wealthiest and most influential families in the metropolis, which shows that it "pays to advertise." But, jesting aside, this incident proves a much more important thing, and that is that nothing is too good for children, and that mothers and fathers will pay any price and make any sacrifice if the real salvation of the teeth of their children can be assured.

I introduce this argument here, because in discussing both of my previous papers, for I have read two, one in New Jersey and one in Canada, men stood up and said, "Parents will not pay for gold in children's teeth." Gentlemen, I tell you that parents will pay. They pay me. They always have paid me, for the foundation stone of my practice has been this one determination, to fill children's teeth with gold. I have done it from the days when I worked for another dentist on a salary of six dollars per week, and I am doing it yet. I have done this class of work for the children of servants, for the children of laborers, for the children of small shopkeepers, for the children of artisans, for the children of the rich, and the reason is that I can prove to any mother that one gold filling that lasts a life-time—let me repeat that, a lifetime—is cheaper than two, four or a dozen temporary fillings that leaves the tooth in a hazardous condition at the end. One thing more before I pass this phaze.

I am told that parents will not pay for gold in their children's teeth. This is my answer. Once I spent July in the woods of Maine, and I brought away a lasting impression which I fear my words can not adequately convey to you. I came upon a cow moose in a brook, with her calf. The cow started away and left the water. The calf stuck his head in the brush and thought himself hidden, and the mother moose came back and stood within easy gun range, calling that calf till we started him out and sent him to her. I saw mother does with their fawns refuse to leave the water at our approach till the fawns went with them. I saw a mother duck start up and fly around and ahead of our canoe, leading us away from her flock which lay hidden, yet easily seen at the edge of the bank. I saw a mother mink twice swim across a brook followed by her young, seeking a place of safety, the while risking her life for her young. I have seen a mother partridge stand with ruffled neck while her flock sought cover, and stand so defiantly that for experiment my guide showed how, with a noose at the end of a stick, he could capture the bird, which, of course, we then released.

And who shall dare say that the human mother cares less for her young than those of the lower animals? If ever you meet such a mother then pity the child. Fill its teeth with gold without fee if necessary, for that child, reared without true mother love, will need all its organs intact to fight the battle of life.

But you are waiting for my why and my how. Why do I fill children's teeth with gold? I do so at present because I have done it for twenty-five years unremittingly and successfully. By successfully I mean much. I mean that practically all children placed in my care from the outset, whose initial cavities of decay have been filled by me with gold, have rarely suffered the loss of pulps in teeth so filled, and never from decay recurring about those fillings. I should here be more explicit and state that I am especially speaking of the occlusal cavities in sixth year molars. These cavities, properly filled at a very early age with gold, should never need attention again. Any failures that I have had in these six locations (I place two fillings in each upper molar and one in each lower), any failures, I repeat, which I have met in these locations, have been due to my own faulty work, not to the fact that the teeth were filled with gold. These failures have served the purpose of accentuating the necessity for close observation of all the requirements of the technique. But these failures have been reparable, where the children have been under my exclusive observation, for at the first sign of imperfection along the margins, it has been my practice to remove and refill the tooth without charge. For I am so sanguine that this method need know no failures that I blame only myself when failure occurs. This, by the way, is a good method for the dentist, for since none of us like working gratis, we become more scrupulous with each operation at the initial attempt.

I can not recall a single case of pulp exposure due to redecay in the morsal surfaces of molars filled early by me. Unfortunately many children, in spite of training, grow up with uncleanly habits, and for this or other reasons approximal decays occur and may become so rapid or so advanced through negligence that pulp removal would be requisite. It must not be presumed that I mean that because I have filled the morsal surface of a molar with gold, no other surface of the tooth will decay.

The orthodontists have proven the tremendous importance of the sixth year molars. In diagnosis today the eye of the trained orthodontist first rests upon these four teeth. It is of equal importance that the operative dentist should do likewise. At the first advent of his young patient close examination should be made of the morsal surfaces of the newly erupted sixth year molars. If the cusps be long, and the sulci deep and well defined, fillings probably will be required earlier. Much has been said both of the difficulty and painfulness of filling children's teeth. But please bear in mind that while I am radical enough to wish to see all cavities in children's teeth filled with gold, the special message which I bring has specific relation to the six morsal cavities in the four sixth year molars. If properly done and at the proper time, these cavities can be well filled and practically without pain.

I shall not stop to explain why it is more painful to cut carious dentine than to cut dentine which has not been so affected, or perhaps I should say infected, but the fact remains that these cavities, if prepared in a sense before they are actually carious, may be cut painlessly. Thus the time when the fillings should be inserted is when the first real carious spot is observable. This generally is at the deepest part of the sulcus, or at the crossing of the sulci. Often a fine explorer will sink quite deeply into such a pit, whereas it will find ingress nowhere else. I will let the technique of filling these cavities wait a moment.

The morsal surfaces of the sixth year molars filled, the next to need attention will probably be the sulci of the bicuspids, though it is more common to find the upper bicuspids requiring attention than the lower. And here I arrive at a pause. For a quarter of a century I have been using gold fillings made with foil exclusively for permanent fillings in children's teeth. Where environment or other cause rendered it impossible to make a proper gold filling, I have temporarily used gutta percha, carefully explaining that the filling was temporary and that early replacement would be essential. That is a practice that has been uniformly successful in my hands for twenty-five years. This is why I consider the method and the practice good. I still advocate it absolutely and without exception in what I term initial cavities in the occlusal surfaces of molars and bicuspids.

But the inlay has come into our procedures as a permanent method of treatment, and I have great faith in the future of the inlay, properly made. The porcelain inlay for conspicuous places and the gold inlay for deep cavities or where great masticating stress is to be resisted, must in future have due consideration. Consequently in approximal cavities in the incisors of children we would often properly prefer porcelain to gold. In large or deep cavities in molars we may find it advisable to use the gold inlay, but as this would still be filling the child's tooth with gold, it is not a departure from my advocacy of gold, though not really a gold filling. The truth is that in arguing for the use of gold I am arguing more particularly against amalgam and the plastics, and the ease and perfection with which a large gold inlay may be made leave less excuse than ever for amalgam.

But I am ready to cross swords with the inlay fanatic in the localities especially under consideration, viz., the initial cavities in the occlusal surfaces of molars and bicuspids, and this brings us to the technique of these operations.

If possible I prefer to fill these cavities when the very first trace of caries is discovered, and such cavities may, with rare exceptions, be painlessly prepared. First, avoid the actually carious spot. This, I believe, is the reverse of common custom. Men generally clear out the decay and enlarge the cavity toward the periphery. But in these initial cavities of decay two points are important. They are to be cut as narrow as possible, for thoroughness, and the actually carious spot is to be touched last. And the reason of this is that if hurt is to come it will come when the real caries is removed, and it is essential when the child shrinks to be able to say, "That's all." The course to be followed then is to take an exceedingly fine broken bur and sharpen it into a spear drill. This should be done for the case in hand. With this drill the sulci should be opened from their extremities toward the deepest point where the decay has been inaugurated. Next use the very tiniest of round burs, and it must be one never before used. The sulci are cleared out with the bur, following the path of the drill, from the ends toward the center, and avoiding as much as possible the real caries. With this bur or one a size larger the edges or margins should be perfected. Lastly, with a bur just large enough to thoroughly clear out the carious portion, all caries is removed, with rapid, continuous work, even though it does cause some pain. Finish this, the bad part of the operation, at one attempt. Then soothe the child. Pet her, jolly her, bully her, according to her temperament. But the main factor is to be able to say, and say truthfully, "That's all."

A cavity so prepared is no place for an inlay. I lay down the gauntlet here to the inlay man, and let me tell those that will dispute with me that this method has stood the test of twenty-five years, of twenty years, of fifteen years, without recurrence of decay. Your gold inlay man must show me such places filled with inlays fifteen years ago before I would consent to cut such cavities wide enough to fit matrices and make inlays for them.

And now I approach a feature of this cavity preparation which I trust will be freely discussed with me. I attribute all the success that I have met with these cavities to this narrow cutting, and that is why I prefer to fill these cavities at so early a period that they may be kept narrow. I do not wish to see these teeth actually decayed. I wait only for sufficient decay to give me a rational excuse for placing the fillings. The point of importance is this: After the filling is placed the edge of the gold is not at the margin of the cavity. I build the gold up above and over the true cavity margin as high as the bite will permit. To my mind there is no place where caries is more apt to recur than along the margin of a filling in the morsal surfaces, where the true margin is not well overlapped with gold. Let me make this clearer. Where the cavity is already large, so that preparation is according to the general rule, and the cavity wall rises at right angles to the floor, when gold is packed therein and then polished down to the actual margin of the cavity, we have a brittle substance, enamel, supported and protected from crushing stress solely by the juxtaposition of the gold. This I may term lateral protection. Thus the friable enamel is protected only laterally against stress which is mainly vertical. I believe that much of the failures along these margins have been due to fracture of the margins first, which fracture has caused or rather invited caries. These margins may be accidentally injured while placing the gold, or at a minute point the gold may not lie as close as elsewhere; or other causes may invite the disaster.

With the initial cavities, prepared, as I have described, with the narrowest cutting possible to fully remove all caries, and the gold freely built up, the actual cavity margin, the enamel edge, is protected from vertical stress by the overlapped gold which intervenes. I may be told that gold so placed will spread and chip away. I can not dispute other men's experiences. I will only say it has not been mine.

I shall not further defend my position until apparently vulnerable points are attacked in the discussion. Let me remind you that I have been to two mills with this corn already, and have not been pulverized yet. I have a few arguments in reserve. Let us talk it all over.

In conclusion may I offer you a few alleged epigrams:

The permanent teeth of children should be filled with gold if you desire them to be permanently filled.

If children's molars are filled with gold when they seem to need it least, they will never need it more.

The man that does not love children can not properly fill their teeth with anything. The man who does love children can properly fill them with anything that it would be proper to fill them with.

Only such men as love children should fill the teeth of children.

and such children will love to have their teeth filled by such men.

The men who love children can fill children's teeth with gold, and those who do not love children should not fill their teeth at all.

The man who claims that children's teeth can not be properly filled with gold practically admits his incapability to deal properly with children.

The object of filling a tooth is to save it permanently. If the filling used would not save the tooth of an adult there is no valid excuse for placing it in the tooth of a child.

If the child had a say in the matter he would probably choose to have his tooth filled once, rather than twice or ten times. Why take advantage of his not having a say?

The tooth of a child needs a filling that will save it for a longer period than in the case of an adult; then why temporize?

Here's a last word especially addressed to "the busy dentist":

Don't fill children's teeth at all. You have not the time.

ACUTE ULCEROUS GINGIVITIS.

BY THOMAS L. GILMER, M. D., D. D. S., CHICAGO, ILLINOIS.

Acute ulcerous gingivitis is a disease seen but rarely and has not, so far as I am able to discover, been previously described. The onset of the disease is sudden, the earliest symptoms indicated by a slight malaise which is quickly followed by rapid ulceration, at first confined to the gingivae, usually about two or three of the anterior teeth on both jaws simultaneously and in corresponding localities; later it is extended to the gums about a number of the teeth, or groups of teeth, but rarely if ever does it include the entire gum margin. The lingual margins and festoons of the gums do not participate at first in the inflammatory processes, but later the festoons are destroyed and deep pockets are formed in the interproximal spaces. Still later the lingual gingivae participate, but in no case have I seen ulcerous manifestations in this locality. In twenty-four hours after the patient's attention has been called to the condition of his gums, the parts attacked present the appearance of having been gnawed away until most of the gum tissue overlying the alveolar process immediately adjoining the teeth has been destroyed. The part of the gum attacked has soft, thickened, and in some instances everted margins. The eroded parts form pockets which are filled in with a grayish pasty mass, similar to that found in syphilitic ulcers in the mouth. When this mass is removed a granulating surface is exposed which bleeds easily and is very painful to the touch. The mucosa for a short distance from the ulcerative margins is of a dark red hue as a result of the congestion. The gum covering the cervical and interproximal surfaces of the teeth is destroyed sufficiently in some cases to uncover the teeth down to the alveolar border.

The breath of the patient is fetid, the saliva ropy and in excess of the normal. The temperature in the early stages of the disease ranges about 101 degrees. The patient is nervous and anxious, the appetite is poor, sleep is disturbed, the bowels are constipated. Bloody saliva escapes from the mouth during sleep, staining the pillow.

Without treatment the ulceration does not appear to extend beyond the gingival border of the gums, nor deeper than the alveolar process, but when the case is neglected the entire mucosa of the mouth in a degree participates in the disease, that is, to the extent of becoming red and tender. The ulceration seems to be limited to the areas indicated, and after the destruction of the mature tissue has ceased, the granulations only appear to be destroyed, leaving the pasty mass covering.

The submaxillary lymphatics become involved early in the disease. Macroscopically no pus is observed, but the microscope shows pus cells in abundance.

It is not necessarily a disease of the poor, or those of impaired vitality. It is not confined to those who are careless of oral hygiene; neither is it traceable to metallic poisons, syphilis or renal disease.

With treatment, consisting of local applications of antiseptic washes only, the disease yields slowly, extending over a period of two weeks or more.

After having treated a few cases by local antiseptic applications only, and finding the obstinacy of the disease to such treatment, and knowing how sensitive the gums are to mercury, I concluded to try its effect by giving small doses of calomel in combination with the local treatment, with the most happy results. The home treatment consists of taking four tablets of mercurous chloride, 4/20 grain each, morning, noon and night, followed by a saline cathartic on rising. The gums are thoroughly cleansed before breakfast by a swab of cotton dipped in 3 per cent pyrozone. Every two hours during the day the mouth is flushed with a warm saturated solution of boric acid, to which is added one drop of the oil of cassia to two ounces of the solution. The office treatment consists in a thorough cleansing of the parts in the afternoon with 3 per cent pyrozone, followed by the application of compound tincture benzoin. On the third day under this treatment a marked improvement has uniformly been observed, and in a few days more the gums have been fully restored. In the place of the benzoin, dilute tincture of iodine may be substituted with equally good results.

I have twice attempted through cultures to discover a specific organism to which the disease might be attributed, but without success. When another case presents further search will be made for the cause.

THE RÔLE PLAYED BY CERTAIN ACID DERIVATIVES OF LACTOSE IN THE EROSION OF TEETH.

BY GEORGE W. COOK, D. D. S., CHICAGO, ILL.

Lactose is the dissaccharide found in milk. So far as we know, under normal conditions it is found in none of the other fluids of the body. Like the other dissaccharides, when hydrolized it yields two hexoses. Galactose is the product that interests us most in this case. Under ordinary physiological conditions galactose is oxidized in the body to carbon dioxide and water, thus supplying energy to the economy the same as dextrose and other carbohydrates. It is well known, however, that under certain conditions galactose may be the precursor of certain acid derivatives of which galactonic and mucic acid are the most important. These acids can be easily prepared from galactose by the action of nitric acid in vitro—and it is generally believed that similar processes take place in the body. These processes, if not directly initiated by the enzymes, are at least governed by them.

Clinical observation and experimental data both prove that the body metabolism may be so changed by external conditions as to materially affect the amount and kind of the product formed by the enzymes.

Under normal conditions, these changes may be represented as follows:

$C_{12}H_{22}O_{11}+H_2O—C_6H_{12}O_6+C_6H_{12}O_6$.

Lactose—Galactose and dextrose.

$C_6H_{12}O_6+O—C_6H_{12}O_7=CH_2OH(CHOH)_4.COOH$.

Galactose—Galactonic.

By the oxidation of the alcohol end of this chain we get mucic acid: $COOH(CHOH)_4+COOH$.

This acid is isomeric with saccharic acid which is formed in a similar way from cane sugar. I do not wish to infer that mucic acid is formed from lactose only, but the conditions under which it is found in greatest abundance in the body leads me to believe that it is generally formed from that sugar. However, isomeric acids may be formed from almost any carbohydrate. For example:

From dextrose—Glutonic acid, saccharic acid.

From mannose—Mannonic acid, mannosaccharic acid.

From galactose—Galactose acid, mucic acid.

It is well known that the mouth constantly contains bacteria, many of which will form lactic acid in cultures outside of the mouth—and presumably likewise form it in the mouth from the carbohydrates of the food. However, no definite and conclusive proof of its presence in the mouth has been shown. It is generally believed that lactic acid is the cause of caries, and it is held by many that erosion is also caused by lactic acid. However, there are many cases of erosion that the lactic acid theory is entirely inadequate to explain.

Professor Kirk, in a recent paper, has put forth the idea that erosion in general is due to lactic acid. His experimental evidence, however, is not sufficient to warrant general acceptance of the view, and his evidence has been questioned by Acree and Hinkins. Lactic acid may play a part in erosion, but I do not think it plays the most important part. While working on the problem in the physiological laboratory of the Chicago University, Mr. McGuigan suggested that mucic acid might be a factor in the causation of erosion. This suggestion seemed to be reasonable in that it corresponded with many of my clinical observations.

It is a fact of daily observation that during gestation and other critical periods of a woman's life the teeth suffer severely. During these critical periods, and especially during gestation, we know that lactose and its derivatives appear in relatively large quantities in the blood and tissues of the body. So much of it may be present that it is often found in the urine. It is also during this time that the saliva presents a thick, viscid, ropy consistency. This mucoid substance contains the precursor of mucic acid. By hydrolytic and oxidative changes this easily gives rise to mucic acid. Under normal conditions there is only a small amount of acid found and it is readily oxidized to carbonic acid and water or neutralized by the bases of the body. Under changed conditions there may be (1) a much larger amount of acid formed or (2) the lessened oxidative powers of the tissues allow an excessive or pathological accumulation of the acid (acidosis). Hypersecretion of the mucous gland of the mouth, independent of the carbohydrate food, may furnish the precursor of this acid. Mucin, especially, will give rise to mucic acid. The location of the teeth permits them to be bathed continuously by these products in a manner very similar to that used in the experiments cited below.

To obtain experimental data in support of this view, I obtained mucic acid and carried out several experiments, which, although not finished, furnish sufficient proof to say that mucic acid is an important factor in erosion. At least in experiments on teeth in vitro, undoubted erosion can be produced.

Mucic acid is a sparingly soluble dibasic acid which probably exists in the mouth in the form of a salt or an acid salt. The salt would be more soluble. In my experiments, I used a saturated solution and several solutions of partial saturation. In these solutions I suspended teeth with the crown immersed. They were allowed to hang in this solution and each day taken out and brushed with a stiff tooth-brush. After several months, all showed typical erosion, most marked at the junction of the cementum and enamel. This was so definite that my colleagues had no difficulty in detecting it. In every respect it was identical with erosion occurring in the mouth.

Teeth treated in a similar manner with lactic acid also showed disintegration of the tooth substance, but this was in no case similar to erosion and could be distinguished from the true erosion by feeling in the dark.

These experiments prove that a typical erosion can be produced by mucic acid, and that lactic acid does not produce a characteristic erosion.

In order to obtain further evidence in favor of my views, I made several hundred determinations of the electrical conductivity of saliva. I also determined the freezing point of the series. Some of these were from normal cases, others from cases of true erosion. In many of these the reaction to litmus was acid. I could not reach any definite conclusion from my work on conductivity or from change of freezing point, as the normal salivas differed more amongst themselves than they did from some of the cases of erosion. I next polarized the series, but was still unable to reach anything definite. However, I believe in a carefully selected series of cases physical chemistry will aid in the solution of the problem. Under normal conditions the reaction of saliva is neutral or slightly alkaline. In erosion, my experience leads me to believe it is always acid. It is well known that in increased muscular exercises or nervous activity, and in increased metabolism the body fluids become acid, or at least diminished in alkalinity. Under normal conditions these acids are neutralized by ammonia and the fixed alkalis. Under excessive changes of metabolism and nervous changes, occurring especially in gestation, puberty, etc., the secretions, and especially the saliva, become more acid, and consequently exerts a deleterious influence on the teeth. This deduction is drawn from known physiological phenomena and coincides with my experimental findings and clinical observations. While lactic acid may play a part in erosion, its method of formation leads me to assign to it a less important factor. The nature of erosion and its frequent occurrence at times when the acid derivatives of lactose are more abundant in the body, leads me to give mucic acid a more prominent place.

I want to thank Doctors Mathews and McGuigan, of the University of Chicago, for aid in this work.

THE INTERMAXILLARY ANCHORAGE IN ORTHODONTIA.

BY MARTIN DEWEY, D. D. S., M. D., KANSAS CITY, MO.

There is no form of anchorage in use at the present time about which so much has been written and about which we have so many different opinions; no form of anchorage which has done so much to revolutionize orthodontia, nor is yet so imperfectly understood, not only by the dental profession, but by some practitioners of orthodontia.

There is no form of anchorage which admits of being used to such an advantage and none which is capable of producing so much harm if not properly applied. It is with these thoughts in mind that I have decided to write this article.

"Intermaxillary anchorage is so designated because the principle involved is such as to require distinction from other anchorages. It is a new form of anchorage in that the anchorage, or resistance to the moving teeth, is derived from teeth in the opposite arch. This may or may not be used reciprocally."—(Dr. Angle.)

Such is a definition and description of intermaxillary anchorage. The resistance required to move the teeth of one arch is gained by attachment being made to teeth of the other arch. This may be only one tooth in some cases.

This form of anchorage was introduced by Dr. Edward H. Angle and described in the *Dental Cosmos* in 1891. In his treatise on malocclusion (6th edition) it is described under the name of occlusal anchorage, from the fact that "the anchorage is principally due to the direct or indirect resistance of the opposing teeth through the occlusal planes."—(Dr. Angle.)

The origin and principle of intermaxillary anchorage was given to us in 1891 and has been used more or less by Dr. Angle from that time to the present.

In 1893 Dr. C. S. Case, of Chicago, used the intermaxillary anchorage as an auxiliary to the occipital anchorage in treating a case of Class III. This câse was reported at the Columbian Dental Congress. Dr. Case operated more or less on all the teeth by the use of intermaxillary anchorage, but did not grasp the full possibilities of the principle because he used it as an auxiliary to the occipital anchorage. The principle was the same as advocated by Dr. Angle in 1891.

The first record I can find of the more extensive use of the principle as first given us by Dr. Angle, independent of any other anchorage, was as used by Dr. H. A. Baker, of Boston. Dr. Baker accomplished something which had never been done before by the use of intermaxillary anchorage wholly independent of any other form of anchorage. He moved the entire number of lower teeth forward—heretofore such movement was only accomplished by the method of Dr. Kingsley known as "jumping the bite." When the case was shown to Dr. Angle he became so impressed with the possibilities of the extended use of his principle that he named this form of intermaxillary anchorage "Baker Anchorage" in remembrance of Dr. Baker.

The use to which Dr. Case put intermaxillary anchorage in 1893 was similar to the use by Dr. Baker, except Dr. Baker used it in Class II, while Dr. Case used it in a Class III case. We also find that Dr. Case used intermaxillary anchorage as an *auxiliary* to occipital anchorage, while Dr. Baker used intermaxillary anchorage alone and independent from any other anchorage. The use to which Dr. Baker carried the principle of intermaxillary anchorage was farther than Dr. Case went.

After the use to which Dr. Baker put the intermaxillary anchorage, Dr. Angle then carried its use still farther. We find him using it in the treatment of Class II divisions and subdivisions, and Class III and subdivisions, and complicated cases of Class I.

Before the extensive use of intermaxillary anchorage occipital anchorage had been the only means of treating cases of Class II and Class III—I mean when the entire number of teeth were to be moved distally.

It is true that stationary anchorage and the traction screw as given to us by Dr. Angle was available in some cases. The objection to the stationary anchorage and the traction screw was that a large number of men did not get stationary anchorage as originated by Dr. Angle, consequently the traction screw was useless.

The principal objection to both occipital anchorage and stationary anchorage was that they usually required the extraction of some tooth, or teeth, thereby destroying all possibility of normal occlusion.

A few cases belonging to the first division of Class II and some belonging to Class III could be treated with the occipital anchorage without extraction. Cases belonging to the subdivisions we could not treat without the sacrifice of a tooth, except with great difficulty. I have never heard of any cases belonging to the subdivisions that were treated without extraction prior to the use of intermaxillary anchorage.

We were unable to move the lower teeth forward unless we resorted to the method of Dr. Kingsley. The use to which Dr. Angle has put intermaxillary anchorage shows that it is not only possible to move the lower teeth forward, but you can also move the upper ones backward. You can move the lower ones forward the entire distance or the upper ones backward the entire distance. By the entire distance I mean far enough to establish normal occlusion. If the case demands it, you can divide the movement between the upper and lower teeth.

In cases of Class III the lower teeth can be moved distally, or the upper teeth mesially, according to the demands of normal occlusion. This forward movement of the upper molars is something that I do not believe was done before the perfection of intermaxillary anchorage by Dr. Angle excepting by Dr. Baker. I mean the forward movement of the upper molars as well as the anterior teeth. It is true the upper molars have been moved, unintentionally in a large number of cases, in attempting to move the anterior teeth distally after the extraction of a bicuspid, but such cases were accidents and not the result of scientific treatment.

Dr. Angle's treatment of cases belongs to Class II and his methods of using the intermaxillary anchorage has often been falsely represented by other men. I do not know why they should be, for they are very plain to anyone who will study them from a scientific standpoint.

A paper which he read some time ago has been the principal point of attack. Dr. Case has written several articles, devoted almost wholly to criticisms of Dr. Angle's method of using the intermaxillary anchorage. Those criticisms were not based on the entire paper, but on a few words as found in the paper. A careful study of the entire paper will show quite a different meaning from that which Dr. Case would have us believe. Dr. Case quotes from a small portion of the paper and by so doing establishes a very wrong impression.

Nothing can be more misleading than to follow such a plan of quotation. By simply using a part of a paper you can get no adequate meaning of the entire. If we read Dr. Angle's article, and read more than a mere portion of it, we will see that Dr. Angle does not advocate as Dr. Case would have us believe, "an equally reciprocal movement of the upper and lower teeth," as the proper treatment of all cases. What Dr. Angle does teach, and the article in question shows, is to treat all cases according to the demands of normal occlusion and facial art. If the case demands "an equally reciprocal movement of the upper and lower teeth" the case is treated with that point in view. If the case demands a forward movement of the lowers the entire distance, so as to produce normal occlusion and normal facial outlines, the case is so treated. If the case demands that the uppers be moved back the entire distance to produce normal occlusion and proper facial outlines, the case is treated in that manner. If the case demands that the teeth of each arch be moved some, but those of one arch more than those of the other, the case is so treated. The reason some men of the old school claim that such a procedure is impossible is because they have not grasped the possibilities of the intermaxillary anchorage.

To go back to the case in question as quoted by Dr. Case: "If the molars and premolars of the upper dental arch are moved distally one-half the width of a cusp of a molar or premolar, and the molars and premolars of the lower arch be tipped forward in their alveoli to the same extent, or one-half the width of the cusp of a molar or premolar, there will be normal mesio-distal relation of the teeth, and if the arches in the regions of the incisors be put in true at the same time there will be harmony in their relations and the best effect will have been produced upon the facial lines." (Dr. Angle.)

This quotation is given by Dr. Case in attempting to prove that such is the treatment by Dr. Angle in all cases of Class II. Dr. Angle and the men of the new school do not treat all cases of Class II by that method, that is by an equally reciprocal movement of the upper and lower teeth. If the cases demanded such treatment Dr. Angle so treated them. The method outlined was not given as a universal plan of treatment, but applies only to those cases in which the malocclusion and deformed facial lines demand such a procedure. The illustration was made very simple, but apparently too simple for some of the old school to grasp.

We also find in the article in question the following statement, which, if Dr. Case has read, he has failed to comprehend, viz.: "This plan of treatment I have been practicing but three years, and so pleased am I with it in the large number of cases I have treated that I no longer practice or believe in plans that I formerly advocated, as that of gaining harmony in the size of the arches by the sacrifice of the first two premolars and retracting the cuspids and incisors to close the space, or by the plan known as 'jumping the bite,' first advocated by my friend, Dr. Kingsley." (Dr. Angle.)

Dr. Case evidently only saw the first few words, viz.: "This plan of treatment," and would have you believe by "this plan of treatment" is meant the "an equally reciprocal movement of both lower and upper teeth." A careful reader of the paper will see differently. The true meaning of the paper, and what Dr. Angle said, was the comparison of the treatment of Class II cases by the intermaxillary anchorage as against the methods he formerly practiced, that of the sacrifice of the first premolars, or "jumping the bite."

I do not see how anything can be more plain than the teaching of Dr. Angle on the use of intermaxillary anchorage in cases of Class II. We also find that in Class III Dr. Angle makes use of the intermaxillary anchorage. We also find that the movement of the upper and lower teeth are varied according to the demands of the case. We find no set rule except as established by normal occlusion and facial lines.

Those who are not familiar with intermaxillary anchorage are not making use of the best anchorages we have today. The reason why it is such an advantage is because the uses are many and varied, but unless one is familiar with the demands of normal occlusion much harm can be done. Much harm can also be done if you would try to use it as some of the old school would have you. To use it as an auxiliary to occipital anchorage, and to attempt to claim origin for the principle of intermaxillary anchorage clearly shows a lack of knowledge in regard to its use.

The many scientific uses of intermaxillary anchorage have made possible the classification of the principles. From the uses of intermaxillary anchorage, we find they can be divided into primary and compound. In primary intermaxillary anchorage we have the force required to move a tooth of one arch obtained from a tooth or teeth in the opposite arch. In compound intermaxillary anchorage we have the force required to move a number of teeth in one arch obtained from a number of teeth in the other arch.

We also have primary and compound intermaxillary anchorages divided into rigid and reciprocal. In rigid intermaxillary anchorage, either primary or compound, the anchor tooth, or teeth, do not move at all. In reciprocal intermaxillary anchorage, either primary or compound, we accomplish more or less movement of the teeth in both arches.

A brief outline of this classification will be:

1. Primary.
    1^1. Rigid.
    2^1. Reciprocal.
2. Compound.
    1^2. Rigid.
    2^2. Reciprocal.

A review of history shows that Dr. Angle gave us the principle of intermaxillary anchorage in 1891 and the principle has been modified until the uses have been many, and by the careful study of the principles you will agree with me that the intermaxillary anchorage is capable of doing all the new school claims for it.

EXTIRPATION OF THE PULP AND FILLING THE ROOT CANALS.*

BY DR. GRAFTON MUNROE, SPRINGFIELD, ILLINOIS.

To write upon such a subject as the title of this essay is almost presumption, especially before such a body as this, in which the members have already well established methods of operating along these lines. You will, therefore, pardon the apparent double-header subject or title of the paper, as in my mind these two acts are so co-related as to seem to belong to the same operation. In fact, I find myself drifting into a line of practice where immediate filling often follows the extirpation of the pulp.

---

* Read before the Morgan County Dental Society, Jacksonville, January 11, 1906.

In this day of pressure anesthesia and the use of kelene or chloride of ethyl, the devitalizing of the pulp by arsenic has become a back number, only to be used as a time consumer or court of last resort.

It is not the purpose to touch further upon the use of arsenic but to proceed to the most popular way of removing pulps as used in my practice. In many cases without even the use of kelene I proceed with a new small round bur and make a direct opening into the bulbous portion of the pulp, using the plain suggestion, hypnotic, if you please, that it may hurt a little but so momentarily that the relief afforded later and the time saved in so doing justifies the method. If there is reluctance in permitting this procedure a few inhalations of nitrous oxide or the local application of chloride of ethyl makes matters easy, and the pulp being reached, pressure anesthesia method finishes the work of further pain and the operation of removal is simple.

This much has reference to cases where the coat of mail is comparatively intact, as in cases preparatory to making bridgework; but many cases come to our attention where caries has done much, if not all, the work of exposing the pulp, and we have but to remove the debris and proceed with the anesthesia and consequent removal.

It is not the purpose of this paper to describe pressure anesthesia, and hence we are now ready for removal of the pulp.

Be sure that you have removed all angles that would be obstacles in the way of proper access to the pulp and do not try to save tooth substance when getting out the pulp is the goal you desire to reach. There is hardly any part of our operative work that has so much of the personal equation in it as the extirpation of the pulp. The careless operator is not in it. It is most trying on our sight—and sense of precision—as well as exacting upon our patience, requiring our best and most conscientious efforts, but alas! the most unappreciated and least remunerated of anything we do. We are fully aware of the results of our neglect; our patients are not. That operator who does not aim to use all the means at hand to assist him in the thorough execution of the desideratum, viz., the extirpation of the pulp, is grossly culpable.

The cultivation of the sense of touch and manipulation of the mirror, as well as the accuracy of applying the *best* of broaches and the careful use of the G. G. drills, should afford sufficient means for the removal of the pulp. The frequent use of dioxygen is an adjunct that should be employed by all operators, especially when the case is one of putresence. This remedy is an excellent mild styptic to check the hemorrhage that often follows the use of cocaine.

In teeth back of the bicuspids, filling roots immediately after extirpation is an operation not often performed, but I have frequently placed bicuspid crowns at the same sitting as extirpation.

Thus far I have spoken only of fresh cases of exposure, and I would not mislead any one into thinking that I always think it wise to do immediate root filling.

In many cases diagnosis of the health of the patient and the predisposition to abscess condition should be the medical aspect that our practice should take.

In the handling of putrescent conditions one of the nicest remedies, where the case has not advanced to an abscess, is caroid solvent,* especially in lower teeth, where gravity comes to our assistance, making the application easier. In upper teeth, however, the use of kalium natrium is a remedy that has proven very useful; and yet with both of these time must be given for the antiseptic treatment of the roots.

Incidentally, your essayist would mention the use frequently in the mouths of children for putrescent teeth, of that most satisfactory remedy which I have spoken of before, called caroid solvent.

In these cases partly cleanse the cavity and then place the solvent in position on a pellet of cotton and a covering, on an additional pellet, of chlora percha. Much help has attended its use and it does not annoy by any disagreeable taste such as creosote or carbolic acid or other pungent remedy. The dread which our patients have of the rubber dam is a very strong argument in favor of humanitarian methods in placing it. The variability of access to the cavity and the possibility of keeping it dry are the guides in the use of the rubber dam. Few operators, I venture, have the rubber dam on when closing the end of the root before placing a crown. I would not oppose the use of the rubber dam. It does seem to me, however, that

---

* Caroid Solvent, a permanent solution of vegetable proteolytic ferment, specially prepared for use as a physiological solvent. Manufactured by American Ferment Company, Jersey City, N. J.

I can obtain more room for manipulation in many cases where I use simply antiseptic napkins and the saliva ejector.

Everything must be in readiness for the operation, and it has often been with grateful expression from the patients that the work is accomplished without putting on the rubber dam.

The medicament which I have used with the most satisfaction of late in the treatment of roots is trikresol and formalin, equal parts, in cases where there is gas, and trikresol alone where there is no gas. Be sure the trikresol is a clear solution devoid of color. There is a reddish variety not so good.

We are now about ready to fill the roots, having had them under treatment for a few days, and all conditions being apparently favorable. With many operators there is and always has been a feeling that the roots must be tightly sealed, almost by the use of force in the placing of the filling in position, packing it very tightly and sometimes forgetting the delicate tissues that are in the neighborhood.

Covered with as delicate a membrane as we find in the conjunctiva of the eye—the tooth root with its peridental membrane and contiguous periosteum—highly vascular and deserving of careful and indeed tender handling, it seems eminently deserving of a filling that should be of such a nature as to take to the roots without much force and to act in a permanently antiseptic way just as the temporary medicated cotton dressing. The old friend, oxy-chloride of zinc, did much for us in days past, and along this line I have been led to adopt the following method: Having root ready for filling, and for the most cases having the rubber dam in place—securing a good view and dryness—I use the oxide of zinc or the powder of ox-para and trikresol, adding carbonized cotton to thicken the paste, when using it for the back teeth, thus making the mixture more readily carried to place, not, however, without a good degree of patience and considerable perseverance, the sense of touch and your judgment telling you when to cease the pumping, and after this, if you desire, a gutta percha cone finishes the filling.

In this you have a continuance of the medication that has rendered your tooth root comfortable, and in tender teeth it has proved itself very valuable in my practice.

CLEANLINESS IN DENTISTRY.*

BY T. H. DALY, D. D. S., MOUNT CARMEL, ILL.

In the few thoughts I have to offer on the subject of cleanliness in dentistry, it is not my purpose to put forth any new ideas, but to try to impress on you, as well as myself, the great importance of being clean personally and then having everything about us in the same condition, and to encourage you to an appreciation of all these little things in which you agree with me in general.

The first and most important point is personal cleanliness. It is not necessary that our clothes be of the latest cut, but they should be clean and give the appearance of having some attention. Then the office coat should always be worn, for the sake of the patient as well as for the sake of the dentist, for, unfortunately, not all our patients are as clean as we would have them. The office stairs, or hallway leading to it, should be kept in a respectable condition. Nothing gives the appearance of slovenliness so much to a patient as having to wade through dust and dirt in going to a dentist's office. I am well aware that we can not all have our offices located as we would want them, and too often we have to submit to conditions that are very difficult to make satisfactory, but we can use a broom and a mop, or have it done, and we can work wonders in this way. If it is necessary to have the stairs or hallway clean, it is more necessary to have the office in the same condition. It should not only be carefully swept and dusted, but should be kept as we would have the best room in our homes. I firmly believe that money spent in making a reception room neat and attractive is well invested, and will bring good dividends.

If we make any effort at cleanliness at all, it should be in our operating room, and, of course, here is where we should make the most determined and conscientious effort. The floor should be covered with linoleum or should be of hard wood, with a rubber rug for the operator. I am not in favor of a carpet for this part of the office. The linoleum answers very well, as it does not retain dirt and can be easily cleaned. The operating chair should be covered with leather, and if not, it should have a napkin on the head rest and a towel across the back. A napkin should be placed over the bracket table. One suggestion as to the waste cotton, that makes such a disagreeable appearance—if a vaseline can be procured and an irregular hole cut in the cover, we will have a receptacle at a cost of five cents that will save us much in our operations as well as when we sweep, for the cotton can be placed in this jar and it will not be necessary to remove it with the fingers.

---

* Read at the Wabash River Section of the Illinois State Dental Society, Newton, Ill., October 17-18, 1905.

As to the actual operations that we perform, I can not speak too emphatically of cleanliness, and not only that, but of asepsis. Every instrument should be thoroughly sterilized before we look into a patient's mouth. Forceps, excavators, and all similar instruments should be boiled. The hypodermic needle and syringe should also be boiled, and the needle should be sharpened on a stone kept exclusively for that purpose. I believe that most of the sloughing and similar conditions that obtain after extraction are due to want of cleanliness. The mouth of the patient should not be overlooked, either, and some attempt at least should be made to do away with the unclean conditions that we so often find. A quick and effective, as well as very pleasant way, to do this is by the use of warm water to which a few drops of Black's 1-2-3 has been added. This should be used with the water syringe. In all operations, when we have to deal with the pulp or root canals, the rubber dam should be used, the affected tooth isolated, and then thoroughly washed with peroxide. After removing all carious dentine another washing with peroxide will make it as nearly aseptic as possible. Broaches should never be placed in a root canal without having been first dipped in oil of cloves or some other germicide. It is well, also, to rub the fingers with the same agent. Contact points should never be forgotten, and all fillings, as well as all surfaces of crowns and bridges, should be polished. Bands should fit snugly and the gums should never be left in a state of constant irritation.

No patient should be permitted to leave the office without having the teeth thoroughly cleaned and then given some instruction as to the best method of keeping them that way.

The tooth brush is often condemned for its ineffectual work, but as nothing else has been produced to take its place, we should advise its use freely, together with a powder and a liquid wash. I am often asked what I recommend and do not hesitate to name a particular preparation, because in my experience with my patients it has proven very effectual. When I do not name a particular powder the patient does not seem to realize the importance of using anything and will be more or less at sea or will neglect the use of the agent altogether. Then we should request the patient to return to the office frequently for an examination. This will stimulate them to keep their teeth in good condition, and even if we do sometimes have to do this free of charge we are not losing by it. Some of the greatest pleasures in my work come from the knowledge that I have been successful in this way.

Now, leaving the operating room and having a look into our laboratories, and I shall be done. Just because the patient never sees the inside of our laboratories is no reason why they should be allowed to gather all of the filth in the office. Plaster should not be allowed to scatter about, and if a little thought is given to this most important part of our offices, it is surprising how easy it is to keep things in good order. All instruments should have a place and be kept there when not in use. In this way they gather very little dust and are much cleaner to use. Impression trays should not be allowed to become covered with plaster and darkened. If they are boiled after being used, in water to which a little soda has been added, they can be easily wiped off, and are kept bright and in a condition that we need not fear criticism. They should be kept in a drawer or some place where they will not accumulate dust.

In conclusion, let me say that everything pertaining to dentistry should be clean, for cleanliness should be the basis of all dental operations.

PRESIDENT'S ADDRESS—HOW TO SUCCEED.*

BY DR. J. F. HUSTON.

Members of the Peoria County Dental Society—Permit me to express my appreciation of the honor which you have conferred upon me. I propose to use this opportunity to give some advice, especially to the young men of this society. Youth is your present glorious possession. It is a time of vision—when we build our castles and weave our romances and dream our dreams. It is also a time of possibility, of special opportunity, of enthusiasm, of quickened and unbounded life, when our characters are formed and our destinies are determined. For, although I believe there is a divinity that shapes our ends, I also believe that we ourselves have much to do in determining our destiny. I want for a few minutes to stand with you on life's threshhold and ask the question, what are you going to make of your professional life and how can you succeed, for we shall all agree that it should be the resolute determination of every young man to succeed in life. We should early form a lofty and noble purpose, and then pursue it in our profession with persevering and courageous tenacity. A drifting and aimless life is a sorry spectacle. A youth without a definite aim is like a ship without a rudder or a compass, at the mercy of the wild, raging sea. It is impossible to overestimate the importance of having a well-defined, nobly-conceived aim. Let all our aspirations soar high. We may probably fall short of them, but it is gloriously possible that we may rise above them, and it is certain that the higher our ideal the higher we may rise in our chosen work. Having formed a life purpose which is worthy of our best powers of mind and heart, the question naturally arises, how is success to be attained?

---

* Read before the Peoria County Dental Society, January 2, 1906.

Well, first of all, it is not to be attained by merely desiring it. Visions never evolve into fulfillment, except as they are translated into the practical details of daily duty. No man ever yet became successful by dreamingly contemplating his ideal, nor is success secured by spasmodic effort. Dash and brilliance may captivate and dazzle, and suggest in our minds some great promise, but observation and experience show that permanent success is not achieved by fitful and capricious endeavor. There is no royal road to success, so the late Queen of England experienced when studying music in her girlhood days. The road we have to travel is the highway of life, which is the common heritage of all mankind. So, then, for our encouragement, let us remember that—

SUCCESS IS POSSIBLE TO ALL.

There is an open competition for the world's prizes. It is not, however, absolutely certain that we shall attain success. Many worthy men fail—we may; but it is nevertheless our duty, as well as our right, to strive for it and to do all within our power to secure it. It is not in mortals to command success, but we'll do more—deserve it. Let us see to it that if we do not succeed the fault will not be ours. I have closely observed young men for nearly thirty-five years, and have mixed intimately with them during that period, in the country and also in the city. In our profession I have seen men fail, and in most, if not in all cases, success has been achieved or failure experienced through circumstances largely within the control of the individuals themselves. First, I would suggest that no man is going to succeed who does not throw his heart and soul into his work. "Half-heartedness is fatal to success," said one to me who had attained great proficiency in our profession. "The secret is to lose yourself in the work you are doing," and so it is. The reason why so many young men do not make headway is because they lack spirit and grit. They appear to manifest no interest in what they are doing, and perform their duties in a listless, apathetic way. It is with them so much work for so much wage, not how much but how little they can do. Their thought is rather for the hour for leaving the office than to excel in the duties intrusted to them. How can such as they reasonably expect promotion or advancement, or be surprised when they are passed over and others selected? No, depend upon it, life's prizes are not thus won. We must put heart and soul into our work if we are to succeed. We do wisely to acquire all the knowledge we can of the work in which we are engaged. There is always room for the man of ideas, so let us cultivate an inquiring mind. Be on the alert for information; not be above being told. Let us take pains to do our best, and be ever seeking to fit ourselves for some higher sphere. As a rule such men are not overlooked. Let us perform our duties faithfully and well. The weapons with which you are fighting the battles of your profession are truth, square dealing, honesty of purpose, integrity, courage, hope, determination and aggressiveness, and the record you make will loudly proclaim that you have used them truly and well, and have taught the world that perseverance, honesty, courage and determination will lead to success. I do not deny that there have been times when our hearts were filled with fear, but another push and another pound of steam have won for us the battle of success.

PROCEEDINGS OF SOCIETIES.

THE MINNESOTA STATE DENTAL ASSOCIATION, MINNEAPOLIS, JUNE, 1905.

DISCUSSION OF DR. OWRE'S PAPER ON "ETHICS."

(See page 344 April DENTAL REVIEW.)

DR. S. R. HOLDEN, Duluth:

I presume we are agreed that ethics, like charity, should begin at home. It is a source of satisfaction to realize that this fact has been taken into consideration by our executive committee in its choice of the essayist for this particular subject. We extend to this committee a lively sense of appreciation for their consistency. And it is furthermore realized consistency is of the closest kin to this subject of "Ethics."

With the ideas presented by the essayist I am in full accord in the main, so will simply attempt to emphasize what seems to be the central thought, which is education.

The great need of our time in practical ethics, it seems to me, is the serious and thoughtful application of our intellect and our knowledge, to the problems of conduct. Certainly the key to the realm of ethics, with more especial reference to its practical side, is a thorough understanding and correct application of right principles, principles looking to the good and well being of the whole human family. We have a thorough exponent of these principles in the person of our present chief executive of the United States, a man who believes in a square deal for all. What a splendid tribute was paid to right principles in the reception accorded Mr. Roosevelt in the city of Denver by their democratic mayor and his people, and what a magnificent indorsement it received in the honor paid him by the Iroquois Club, the leading democratic organization of the city of Chicago. It is right principles people are looking for these days. Not the man, but the representative of right principles. And it augurs well for the future stability of society. We have another illustration of this spirit of thoughtfulness for others as exhibited in the national spirit of the Japanese people, to which our attention is called by the essayist.

He sounds a note of warning as to the spread of the plague of commercialism in the dental world. It is high time steps were taken looking to the control of this evil. It places the profession in a false position in the eyes of the public and works a great injustice to the practitioner who is endeavoring to build a practice in a straightforward and legitimate manner.

Of course, a long time is required to bring about this better condition of affairs, for it is recognized that education is as definite a process as the other sciences of experience. Education means a larger life. A man, to be ethical in the larger—in the highest sense—must be what we might term *the whole man*. A man whose whole number of virtues are in full accord. The fractional man is at some point, or points, in direct antagonism to right principle, and in his attitude to his fellow men.

The suggestion that ethics be taught in our professional schools, I would like to see carried out. It is realized that a man, to be a successful educator along these lines, is not merely to be conversant with the customs and conventionalities of the school room, but must possess a defensible social creed, and in addition to this he must have the power to carry this social creed into effect. The essayist points this out clearly when he declares ethics to be a normative science. It is at once a science and an art. The educator must know, then he must possess the power, or art, to carry out this knowledge.

He further declares that the moral sense is not innate. This is a mooted question. There are those who believe the moral sense is not innate, but all ideas are the result of sense-experience, and they have many followers. Then there are those who believe the moral sense is innate and *they* have a large following, and each side to the controversy produces many point of strong exidence in support of their claims. Then, again, there are those who believe that many of the ideas are reminiscences of a previous state of existence. Again, there are those who startle us with the query "who knows?" Are we, then, to subscribe to a philosophy of pessimism and freedom from all moral obligation and care? A thousand times No, for experience teaches us that it leads far away from the supreme or ultimate. It has always seemed to me that the nature of the mind has much to do with the character of our actions. However, whether the moral sense is innate, or purely the result of sense-experience, the fact nevertheless remains that education training is the one factor looking to its highest attainments. The faculty of moral judgment needs training no less than the faculty of esthetic judgment.

The essayist gives three reasons for the presentation of this subject to us, the third of which is "because it leads to the supreme or ultimate." This sentiment is the very embodiment of the clearest ethical principles. We believe, then, the supreme, or ultimate, to be a condition of absolute justice and truth. Truth can not be an individual possession, like a private pond, but is an ocean wide and vast, washing many shores. Truth is the foundation of every virtue. Truth begets sanity, reason, justice, happiness. A man without these attributes can never hope to become the most "perfect possible instrument of reason."

DISCUSSION OF THE PAPER OF DR. NOYES ON "A COMPARISON OF BEGINNING AND BURROWING CARIES."

DR. T. E. WEEKS, Minneapolis:

So far as a definite discussion, or, as it is sometimes called, a disagreement, is concerned, of course there is no ground left for me to stand upon. The only thing I can hope to do is possibly to emphasize the points Dr. Noyes has made, and still his explanation was so full and so emphatic that even then I am at a loss to know what to say. However, I may be able to diverge slightly and possibly waken some further thought in your minds in regard to this subject.

Dr. Noyes explains that his paper in a measure is a defense of extension for prevention. I think extension for prevention to us who have used it and appreciate it as one of the important factors in our work, in this part of the country at least, needs no defense. But the work was so clearly and thoroughly performed by both Dr. Black and Dr. Noyes, the illustrations showed so exactly what extension for prevention means, that the method of Dr. Black's may be quickly, definitely and surely followed. Of course, we never can have too much of that kind of illustration. Every new presentation of the subject brings out something that we may not have thought of, or may not have encountered in our practice. We always gain something, and consequently are very glad to have an opportunity to refresh our minds. You have all observed in your practice operations such as the one shown in the illustration. The extension for prevention has not been sufficient, and we are all tempted to overlook this zone of danger. We assume that the filling was put in by an operator whose technique was perfect, but the operation for extension was a failure. The other slide presented immunity, so far as decay was concerned, but the technique was faulty. The two examples were exactly the opposite. You have all observed cases where the operator had endeavored to conceal the gold and not allow it to show upon the labial surface, but you have seen the dark shadow, which was a good deal more conspicuous than if the gold had been made to show. The illustration given by Dr. Noyes had reference to the introduction of the gold from the labial side. I have found that in such cavities the insertion can be made almost entirely from the lingual, and I think we should insert as many of this class of fillings as possible in this way. The technique of the operation would be exactly the same. I do not wish to be understood as advocating this as universal practice, but cutting away from the lingual surface is less objectionable than cutting away from the labial. You can always cut away from the lingual without any violation of the esthetics. Furthermore, I have also observed that the advocates of retention of tooth substance in these cavities fail to cut beyond the point of danger on the lingual surface. They have gained separation from the labial, but have failed to cut sufficiently to the lingual to prevent recurring decay on that surface. Of course, this is faulty technique and a violation of the laws of extension for prevention.

In this sort of extreme undermining of the enamel walls, there is no alternative except to expose a large area of filling material, whatever it may be. Many times you have noticed that fillings where apparently such an extension was indicated looked unsightly. The laws of extension for prevention may have been followed, there may be no dangerous areas left on the surface, but the filling, instead of having a graceful curve, may have the appearance of half a buckshot. I call your attention to this because the esthetic sense which we so often violate is often due to failure to observe harmonious lines. Gold exhibits a sharp contrast to the color of the tooth and the surroundings of the tooth itself, and the esthetic sense would be less violated than where those lines are out of harmony with the lines of the teeth. And, gentlemen, when you are obliged to make a filling, for whatever reason, and you have decided to make a gold filling, I wish to make a plea for study in harmony in lines, so that the only thing that will violate the esthetic sense will be the contrast in color between the gold and the tooth surface, and that is not always a painful contrast.

Dr. A. R. **Owre**, Minneapolis:

There is really nothing to discuss in this paper. I have said many times before that you can not discuss a fact. I want to take this occasion to thank Dr. Noyes for coming up here and presenting this subject so tersely and so well. I should like to hear this lecture and see those slides once a month during the remainder of my life.

Dr. E. E. **Munns**, Minneapolis:

I would like to ask the doctor why he could not use the matrix?

Dr. F. B. **Noyes**:

All I can say is I don't want it. I do not think a matrix was ever adjusted so firmly that gold could be condensed against it. If your matrix is so fitted that you can condense gold against it you can do it, but not in any other way.

Dr. A. B. **Allen**, St. Paul:

Being a beginner in the business, Dr. Noyes' paper impressed me very much, especially the instrumentation and finishing employed in the construction of a gold filling. One point he mentioned is the driving of the plugger point always into the angle of the cavity when the filling is inserted, and he also showed that the instrumentation in the filling of a cavity should be in the direction of the gingival margin. It seems to me the filling may be thoroughly condensed and we may leave enough edge by cutting away with a knife. I suppose a good many like myself use a knife when it is a little bit dull and we can not get a perfectly smooth cut. When we cut gold on the gingival margin we have to use considerable force, and it strikes me it is better to use the strip to cut the gold on the margin instead of the knife.

Dr. C. W. **Jones**, St. Paul:

I want to ask one question for my own information. The speaker said he used the flat saw, sawing from the gingival to the occlusal, and then using a flat saw from the occlusal to the gingival. I have never seen a saw used from the occlusal to the gingival, but I may not have understood him correctly. I would like to have an explanation of that point. I was never taught to use the saw in that way and it is something I want to know about.

PROF. F. B. NOYES, essayist:

If you wish to retain the mesio distal diameter you can carry a saw through there and not lose much more than the man that cuts to a smooth surface. If that saw is properly carried through it will practically condense to a small surface. In a good many cases it is better to put on the separator and get enough separation or put the saw through without cutting, but if you have previously separated so you have a perfect mesio-distal diameter to support you can carry it through the other way.

In regard to what the first speaker said, I will confess it was very hard for me to get away from the idea that there was danger in cutting gold away from the margins, but if the condensation is perfect you can not pull the gold away from the margin in trimming.

DR. C. H. ROBINSON, Wabasha:

It has been taught, or I have the impression, that in those cases where a little cohesive gold has been used, that after complete condensation of all pieces of gold, there are certain foot pluggers used upon non-cohesive gold, condensing the overhanging portion of gold. I was wondering if the doctor did not use that method.

DR. F. B. NOYES:

I always do that and use this method also. You go over all these margins with the foot instrument, and especially in the distal cavities of the lower molars, and the only way I know of that force can be applied in the proper direction is to use the back action pluggers, either automatic or the hand pluggers.

DR. A. C. FAWCETT, Rochester:

I would like to ask Dr. Noyes what kind of gold he uses of the non-cohesive. Many have asked me the question today, and I have heard several of them say they use the ordinary prepared standard, and they said if they put two or three of those in it would not make much showing. I would like to have him explain about that.

DR. F. B. NOYES:

I personally use soft cylinders that are already rolled, allowing one for each corner and one for the middle, and they should occupy about the gingival third of the cavity, so as to make this part of the filling of non-cohesive gold.

Dr. J. Q. Byram, Indianapolis:

I want to congratulate this society on having Dr. Noyes on the program. I have had the pleasure of listening to his lectures before and can vouch for the dentistry of Dr. Noyes, and when I see his name on the program I know it means an instructive and interesting lecture.

I wish to say a word or two about porcelain in connection with what he has shown here. I could not help thinking, as I watched his slides showing the cavity preparation of bicuspids and molars, that those enthusiasts who say that porcelain should be used in all forms of cavities will regret such statements in the near future. If you will carry in mind these cavities you can readily see how weak porcelain would be in such places. We must remember that the occlusal surfaces of bicuspids and molars present a series of inclined planes, and we get weak margins to our filling material. We have all had experience in building up such cavities with amalgam, and if we did so the patients always returned with the filling broken away. Porcelain, being weaker than amalgam, can not be expected to stand, unless we can have bulk. I simply mention this because I have heard different dentists remark today that they have followed such and such a teacher's instruction. I do not mean one necessarily connected with an institution, but sometimes if we take certain men's views we may be led astray, and we must remember that anyone who becomes an enthusiast is liable to go to extremes, and those of you who are strong in porcelain work take my advice and confine your work to incisors and large cavities of bicuspids and molars. I do not make porcelain inlays for bicuspids and molars unless a large portion of the tooth is gone. A friend of mine asked me to prepare certain cavities and send them to him, which I did. I saw him a few weeks ago and he said, "I don't like your cavity preparation for bicuspids and molars." I asked him why. He said, "You involve too much of the tooth structure." I said to him that unless too much of the tooth structure was already involved I would not consider porcelain.

I did appreciate the lecture. I learned many points about the insertion and finish of fillings to which I had never given serious consideration, and I hope hereafter I may be able to insert better gold fillings.

Dr. F. B. Noyes, essayist:

There is only one thing further I would like to say in closing the discussion, and that is in regard to these particular instruments referred to as files. There is one thing absolutely necessary in those instruments; they must be sharp and of hard temper, and then, as you all know, an instrument that is hard tempered and sharp must be used with skill. They can be kept sharp by using a knife-edge Arkansas stone. They are spoken of as files, but they are really a series of knives, and they are used as knives and not as files, and the cutting surfaces of those instruments cut like knives. That is why they work rapidly, and you should learn to use these instruments in the proper order. Cut out the central portion of the gingival overlap, then cut out the buccal portion, then the lingual portion, then you trim off the rest of the overlap with the knife, then you round out the filling to the contact point.

DISCUSSION OF DR. PENBERTHY'S PAPER, "THE BETTER THERAPEUTIC EDUCATION OF DENTISTS."

Dr. F. B. Kremer, Minneapolis:

I think I understand what Dr. Penberthy has in mind, and if I do he is on the right track. Certainly I believe in higher education; that goes without saying, but at the same time it occurs to me we have reached a point in our professional career where we must do one of two things, we either have to apologize for our existence or take subjects that belong to us. The Doctor says that he does not mean to say that dentists should always prescribe, but that they should be familiar with the needs of the occasion and send their patients to a physician, requesting that such and such a thing be done. I am not willing to ask a physician to do what I am not able to do myself, therefore I would not think I had any right to make a suggestion of that character to him. I have prescribed where I knew the needs of the case and it seemed necessary. I would like to quarrel with the definition of therapeutics. I am not quarreling with the medical profession, but with their much vaunted knowledge of materia medica I do not believe they are as competent to prescribe for dental diseases as the dentist is himself. Another thing: I do not believe that the ignorance of my dental brethren is as dense as the essayist would intimate, when he says that he does not believe that ninety per cent of the profession are capable of prescribing for two per cent of the disorders that come to them for treatment. There may have been a time when that was true, but I do not believe it is true today. I recently ran across some of the younger profession and I was convinced by the conversation I had with them that there has been considerable advance along that line. In fact, I changed the subject; I found it necessary to do so. (Laughter.) I really do not know myself what percentage of carbolic acid I use. I believe our school has taken a stand for higher education, and it is right, but at the same time perfection in the profession depends largely upon our devotion to dentistry. A man who practices dentistry, even if he has the knowledge to do so, does not need to prescribe very often.

In the main I agree with the doctor. I agree with him that we should have a broader education, and it is wise to call the attention of the profession to it so that the education in our colleges may be made broader.

Dr. Thomas B. Hartzell, Minneapolis:

Dr. Penberthy and Dr. Kremer have touched upon a subject that has been in my mind to a great extent for the last two or three years. I believe you will recognize the fact, if you will stop to give it consideration for a moment, that there is an exceeding tendency to magnify the mechanical methods of treatment. We have spent two or three days now in exploiting almost nothing but mechanical methods in treating dental disorders. The only individuals who have touched upon the other side have been Dr. Penberthy and Dr. Kremer during this time. Is this as it should be? I noticed that in the course in the college with which we started out ten years ago we had two years of anatomy, two years physiology and two years materia medica and therapeutics, but since that time some of those things have been dropped, and the student has been taught the preparation of porcelain and gold fillings, and that sort of thing has been brought up almost to the acme of perfection. This kind of work is given the bulk of attention, while the other is left behind. Whoever gives a clinic and gives time and thought to the other side? If you find one man who does you will find twenty who do not. We need that. Personally, in speaking of the college of dentistry at the University, I do not think there are more than one or two who are standing behind the movement, while we are all standing behind the movement for better mechanical treatment. I would be delighted to see this association express itself on this phase of teaching. We need the backing of the press and the force of the association in order to get it. Dental schools give what is apparently most needed, they give what you are demanding, and you are demanding more knowledge of porcelain and gold, simply giving the mechanical features the preference, and it is hard to get the other unless somebody is asking for it, and unless you ask for it your materia medica and physiology will not amount to much. When a patient comes to us with diseased teeth we take them out and put in a plate. That is the spirit that obtains. That is the general view, and we need some leader along that line who will make dentistry compel the same respect from the public that is now accorded the profession of medicine.

Dr. Shibley:

I think it is advisable to suggest at this time to the master of clinics of the next session that he make it an object to introduce clinics along the line spoken of as much as possible. All of us must have experienced the fact that some great benefit is derived at some time or other from therapeutic treatment, and I believe a great deal of benefit would be derived if this subject was given prominence in the clinics at our next meeting.

Dr. A. R. Owre, Minneapolis:

In regard to the increase of foundation work in dental colleges today, so as to put the graduates on a par with the medical profession, I do not think we can do anything more than we have done. We have done as much as the medical profession in the last twenty-five years. I want to state that the chair of materia medica and therapeutics in the college of dentistry has not been cut down in the last ten or fifteen years, but it has rather been augmented. It has been changed, but not cut down. With one exception where we had to modify the course, we occupy the two years' work in materia medica the same as the medical men do.

Dr. Thomas B. Hartzell, Minneapolis:

I beg your attention for just a moment more. In 1892 and 1893 we had two years' work in materia medica and therapeutics from Dr. Bracken in the college of medicine, and he made no difference between the dental and the medical student. It was all in the same department and he did not know whether a student was in the college of dentistry or medicine. At the present time our college makes therapeutics the limit and therapeutics and physiology are taught together. We do not begin to get the course in therapeutics as Dr. Bracken gave it to us in that one year. This is not a matter of opinion, but I can prove to you that it is a fact. As far as materia medica is concerned, I am not as competent to speak about that, but talking about the subject of therapeutics in this college I know what I am talking about.

Dr. J. W. Penberthy, essayist:

I just wish to say a word. I think Dr. Kremer is wrong when he states that the dentist is better qualified to prescribe for troubles that arise in the mouth than is the physician. If the doctor has reference simply to local applications, the application of iodine, carbolic acid, etc., anything that is applied locally, I agree with him that they are better qualified, but I will not admit that the dentist is qualified to administer to the wants of his patients systemically equal to the physician. The physician is decidedly lame when it comes to the treatment of diseases of the mouth simply because he has been led to believe with the public that the dentist can do it all. Now, the public has not been justified in believing that the dentist can do it all, because he does not do it. He has not been taught to do it and he never will do it until he is taught. We have a field so far beyond us that we can never reach it. It is our duty to place ourselves in a position to care for the ailments of the mouth as it is the duty of the man who treats the eye, ear and nose. If we went to the oculist he would not have a knowledge of the treatment of those diseases. He could simply send out his patient to have a tooth extracted or filled or whatever might be required. We ought to be able to take any class of cases that comes into our office, even to surgery, and treat them, and until we come to that point we are not justly entitled to the position which is accorded us.

As Dr. Hartzell has said, I wish we could get more of this line of work in our colleges. We are running crazy upon the subject of new devices. We take a great deal of time in watching the manipulation of a little piece of work or some new method, and while I believe we should devote some time to such things, I think it is altogether overdone. At our meetings during the last two years very little time has been given to anything except papers on extracting, filling or some work of a mechanical nature. We fall far short of accomplishing the work there is to do in our field, and I hope the object of my paper may be carried out to some extent at least in trying to bring the younger men to realize that they ought to occupy the same relative position in the dental profession as the physician occupies in the medical profession. When we have accomplished that then we shall occupy the position we ought to occupy and then the medical men will come to consult us.

DISCUSSION OF DR. ROBINSON'S PAPER, "THE STATE BOARD OF DENTAL EXAMINERS."

Dr. A. R. Owre, Minneapolis:

I am not in a position to say much about this matter because I am not a member of the board and because I have not made a study of the state laws. However, Dr. Robinson has given us a very concise statement of the law as it is. In regard to this law, I do not think it is the ideal method at all, and I presume that is the general feeling throughout the United States today. What we need is a national board, and in order to secure a national board we need more united support. That was touched upon by Dr. Bowman a year ago. I have spoken to some of the leading members of the profession in the United States, and some of them take a stand against it on account of the legal phaze, and they say these changes would involve a new act by congress, and until trusts and things of that sort considered more important are disposed of this matter will not be taken up. However, the dentists have taken up another phase of the subject, and that is reciprocity, the reciprocity act. That is in effect in some states, but I don't know that it is the ideal method. It is working very well in some states where they have the same standard requirements. Dr. Robinson very modestly calls attention to some of the troubles that the board has to put up with. I had some opportunity to find out a little about those things and I can sympathize with the board on that account, and I can understand why members are anxious to get off from the board as soon as their term of office has expired. We owe a vote of thanks to our dental examining board, a continual vote of thanks, and I know we have an honest board in the state of Minnesota.

Dr. Shibley:

I want to agree with what Dr. Owre has said in regard to a vote of thanks to the State Dental Board. I read this past winter attacks upon the state board by the *St. Paul Dispatch* that were a disgrace to the State. The board looks to this association for assistance, and it is the only source from which it can expect assistance, and undoubtedly the board has not been assisted by this association as it should have been, and every endeavor should be made by the members to aid the board in every way possible in the future, and especially whenever there is a fight such as they had in the legislature last winter.

Dr. C. H. Goodrich, St. Paul:

In regard to the reciprocity clause in the paper, I presume I am somewhat foolish to speak on this point in the manner in which I am going to speak, but to my mind the only solution of this problem is to make it a very simple matter. Now, in my estimation, the simple matter is this in a nutshell: To have a proper committee appointed by the National Dental Association to meet with the National Association of Dental Examiners and the National Faculty Association, that committee to select certain teachers from the different schools to formulate and publish a compendium of subjects that are to be taught in the dental colleges. The question would come up about the different laws in the various states. This would not require a national law and it would do away with the national board. Every man appointed by a governor on a state board would have a compendium from which he would have to select ten questions upon which to examine an applicant. That applicant, having passed the board and secured the proper license under the seals of the state, will present that license or certificate to the supreme court of any state wherein he desires to practice, and he will be granted a license to practice in that state. I believe it to be the most simple manner in which this matter can be handled. The majority of dental students are poor men, and if they pass the University of Minnesota and pass the state board they are here on the ground and their expense is nominal, while if they had to appear before a national board of examiners at Washington or New York it would be too great an expense. In this plan it would be unnecessary to have much expense attached; the only expense would be for a permanent secretary of this committee which formulates the questions, or, it might be well to have a national board to meet once a year to pass upon papers sent them by the secretary of the state board. This would do away with any fear of any person getting through illegally. I could talk half an hour on this idea, but it is talked over at every convention held in the different states and nothing tangible comes of it. The Minnesota board would perhaps be willing to reciprocate with Illinois, but Illinois says they can not do it. The resolution says "may grant license"; it does not say it shall be granted.

Dr. F. E. Moody:

I only regret that the hour is so late and we have the election of officers to come yet, because this is a subject that might be discussed with profit for half a day. We have in this state a good law and we want to be very cautious about making any changes. I have had the privilege of being on the board for five years, and we have never at any time excluded a good practitioner. He may have fallen down in some line or on some subject, but if he has been up in his practical work he has not been excluded. This question of reciprocity has been thoroughly discussed in various organizations, and the National Board spent an entire day in discussing this one thing. Our law says that a man must present himself here for examination. If a man comes from another state and has a good record behind him and wishes to practice here, I am satisfied there is not a member on the board who would exclude him from practicing dentistry in this state. It is men who are not eligible, who are not competent, whom we exclude. I would like to hear this subject discussed thoroughly for the benefit of the entire dental profession.

Dr. Shibley:

I agree with Dr. Moody that we ought to go slow in regard to this reciprocity question. Our standard we have in Minnesota we know full well is all right, but when students come here from another state to be examined by this board they are a little afraid. They appreciate they have to know something to get by this board. I happened to be in St. Louis last fall and thought it would not be a bad idea, in case I had to change climate or make a change for some other reason, to prepare myself for it, so I took my declaration to the secretary of the state board. He said, "Hold up your hand and be sworn." He said he would send me my certificate a little later, and that was all there was about it. I do not believe I could do that in Minnesota.

Dr. J. W. Penberthy:

I have not the slightest doubt but what a good man might get through here. The examining board is very considerate of the man who has been in the harness for a long time, but still there is an element in that, gentlemen, that you can't get around. I know of a man who was one of the finest practitioners in the country who wanted to make a change and go to another state, but he could not bring himself to the point of appearing before the examining board for fear of being turned down. The probabilities are that man could have gone before that board and secured his license without any trouble. He was a man who, I believe, was the peer of any operator in this city, a man who enjoyed the finest practice in this state. I refer to the late Dr. Bowman. He was very anxious to go to Oregon, but he said he did not believe he could pass the examination. I believe there should be some means or method by which recognition of such practitioners could be made possible by the various states. If we have reciprocity let that man who is competent go before his own board and get a letter of introduction from his secretary, because the secretary is apt to know who the men are in his state that are entitled to recognition. He gets that certificate and presents it to the board of the state in which he wishes to practice, and he is not subjected to the humiliation of having to appear before the board and going through the examination the same as the student who is just beginning the practice of dentistry. I am tied to Minnesota; I am not looking or talking for a chance to go to another state, and I don't know that I could go if I wanted to. There is not a man in the profession who is not liable to have to change his base. Therefore, I can't help but think that reciprocity is a practical thing. I think it is a shame to imprison a man within one state if he is a good and competent man. A man in almost any other calling can follow it where he pleases, and why should we compel a dentist, if he is a good man, to stay in one state all his life if he wants to go to another? I believe this is a matter we should look at more seriously. I believe in upholding the board, because I believe we have a good board, but something ought certainly to be done to put this matter upon another basis.

Dr. F. H. Orton:

I would like to discuss one point in the doctor's paper, and that is the prosecution of illegal practitioners. We have one of the best dental laws of any state in the Union, and there is no reason why anyone should be practicing without a license, but it is impossible for the State Dental Board to enforce this law without the co-operation of the dentists of the state. I had a dentist come in to see me some time ago and complain of a man practicing illegally in his town. I asked him if he was sure and he said he was; he said he worked for some patients that the other man worked for. I told him to give me his name and I would take up the case. "Oh, no," he said, "I will not have any thing to do with it." I said I would subpoena the patients and he would not have to give this evidence himself. A man may know of violations and might be the means of bringing these illegal practitioners to account, but he is too cowardly to furnish the evidence and in that way the law becomes inoperative. Another point, if we are called to go to another man's town we are usually handicapped in some way, because the man has friends there who will put something in our way. I might refer to an actual case where we engaged a detective to secure evidence against a man, but he was a friend of the county attorney and the county attorney refused to prosecute the case. We had to drop it. If we had had a good dentist in town who would have co-operated with us the man would have been compelled to stop practicing.

Dr. T. B. Hartzell:

Dr. Moody represents this state in our National Association of Examiners, and he inadvertently brought out the statement that we never kept a good man out of the state if he was a good mechanic. Now, I would like to know what would become of us if our State Board did not help us in bacteriology, therapeutics, materia medica and pathology.

Dr. C. H. Robinson:

As Dr. Owre suggested, the proposition is ideal, but it is impracticable at the present time. It may be put into effect when we are dead and gone. Dr. Shibley speaks about an attack made upon the State Board in an editorial in the *St. Paul Dispatch*. I do not know whether he knows what is back of that, what inspired the editorial. It was inspired by a controversy between the board of control and the dental department of the University. The criticism made by the board of control upon the dental department in regard to instruction brought out the editorial in the *Dispatch* and resulted in a recommendation by the board of control to the legislature of the state of Minnesota recommending that certain action be taken in regard to the dental law. I took it upon myself to go to Colonel Smalley of the *Dispatch,* and we had a heart-to-heart talk. I laid down the facts to him and he met me like a man and said he would see that no criticism of the kind appeared in the future. There was something of a similar nature in the *Pioneer Press.* I saw the reporter who wrote the article, and I told him that not only the board, but the whole dental profession was being slurred in the eyes of the public.

Dr. Goodrich speaks of the idea of making a sort of universal compendium and having a national committee. That is very ideal, but there are objections to that which would be found if it were attempted to carry it out. If we were to place in the hands of the secretaries of state boards of the United States a list of fifty questions, and they were compelled to select ten out of the fifty, the boys would be loaded up with ponies till they couldn't walk. They would have them on their cuffs and everywhere else, and they would be sure to find something that would help them. They do it now in great plenty, but if they had something of that nature it would help them out greatly.

Dr. Moody has voiced a conservative sentiment when he speaks about going slow. He has had the experience and he has seen the necessity of being conservative; still, I do believe that something ought to be done. In the case of which Dr. Penberthy speaks, we all knew and loved Dr. Bowman, and I fully believe if he had gone to any of the officers of the State Board of Dental Examiners and requested a letter to the State Board of Oregon he would have received such a letter, and they would have given him a permit to practice dentistry in Oregon.

CHICAGO-ODONTOGRAPHIC SOCIETY.

A regular meeting of the Chicago-Odontographic Society was held at the Chicago Public Library Building on Tuesday evening, January 16, 1906, at 7:30 p. m.

Dr. W. H. Taggart, the President, presided.

Dr. R. Ottolengui, of New York, read a paper entitled, "Why and How I Fill Children's Teeth With Gold."

DISCUSSION.

DR. G. V. BLACK:

MR. PRESIDENT: I am glad that Dr. Ottolengui has come all the way from New York to read this paper, and I am also glad that I had an opportunity to read it a few hours ago.

There is no tooth the loss of which will derange the features so much as the loss of the first molar, and when I was reading Dr. Ottolengui's paper there came to my mind the book that I give to my students on operative dentistry—my printed minutes. I picked the book up and looked for the heading, "Management of Children's Teeth," and in the first paragraph I read this: "As I have stated years ago, the conditions calling for differences in the treatment of children's teeth and the management of cases in comparison with adults' teeth, are due to childhood purely. So far as the tissues of the teeth are concerned we may make fillings in children's teeth just the same as we make fillings in adults' teeth. The tissues of the teeth are hard enough; they are strong enough."

In the handling of children it is the psychic influences that are important. Years ago a little girl was brought to my office whom we will call Mary. When she was seven years old I filled the occlusal surfaces of the first molars with gold. Before she was 9 years old I had made proximal fillings in all of the upper incisors with gold, and as she grew up many fillings were made in her mouth. Finally I lost sight of her, but last summer, when I was visiting my old home, I noticed a lady coming along the sidewalk leading a little girl some 5 years old, and as she came up to me she held out her hand. As I hesitated, she said, "Don't you know me, doctor?" She put her hand to her lips, and, showing her teeth, said, "They are all there." Then she told me that she had not lost a filling or a tooth or the pulp of a tooth. I tell you, gentlemen, such things are among the most happy incidents of a dentist's life.

Why, if children's permanent teeth are important, should we not do the best thing for them at first? But, as Dr. Ottolengui has said, and as I have repeated over and over, never make a gold filling for a child unless you can control the conditions and make a good gold filling. The reason why gold fillings have failed heretofore when made for children is that they have not been good gold fillings. The confidence of the child should never be betrayed by making a poor filling of any kind. I prefer that the children should grow up with the greatest confidence in humanity.

I might take issue with my brother from New York on some points. One thing, for instance, I should advise him to go home and bundle up all the round burs that he has and throw them into the North River and sink them so deep that they never will be resurrected, for of all things the worst I know of in the narrow fissure is the round bottom to the cavity as made with a round bur. In such a cavity your gold will roll and twist and refuse to lie still. No wonder it is difficult. Take a bur with a square end and cut the fissures leaving square angles along the pulpal wall, and you have no need to build up between the cusps. The gold will stay where you put it. It is then comparatively easy to make perfect margins. One of the secrets of bad fillings has been the making of cavities where the gold will roll, but if you make sharp angles in your cavities you ought not to have any difficulty.

I have been trod upon in this matter of filling children's teeth with gold as has Dr. Ottolengui, for when, in 1895, in the May issue of the *Cosmos,* I said something similar and particularly that there was no reason in the tissues of the teeth to prevent the filling of children's teeth with gold, I was stamped upon; particularly in Philadelphia and New York, as well as some other places.

Now gentlemen in conclusion, those of you who wish to stand up against this idea of filling children's teeth with gold, up and at it.

Dr. C. N. Johnson:

I would like to say to Dr. Ottolengui that we appreciate very much his coming here to give us this paper.

I had always supposed Dr. Ottolengui to be a busy man, but he has intimated tonight that he is not, because he says for twenty-five years he has filled children's teeth with gold, and in the last paragraph he said if you are a busy man don't attempt it. Mr. President, I have an idea that busy men can sometimes fill the teeth of children with gold.

I am not going into this subject except on one or two phases. One is to emphasize the statement of Dr. Black and refer to one made in the essay, that the structure of children's teeth is sufficiently hard to accept gold as a filling material. In other words there is nothing fundamental about the teeth that so changes from youth to middle life or old age as to justify any argument in favor of a change of filling material being necessary. Dr. Black has stated that the idea received a good deal of opposition when it was first presented by him in *The Dental Cosmos* in 1895, but his investigation into the structure and physical characteristics of the teeth of children and adults and elderly people has settled once and for all the contention that there is such a change in tooth structure as to modify the kind of filling material.

Mr. President, it seems to me there is another factor in this question aside from the structure of the teeth, and that is the condition of the individual, and the conditions of the individual do change; so that looking at it from that point of view we are unable to use certain kinds of filling material in youth that we may afterward use with good effect. We are able to subject a patient to a different kind of treatment in adult life than in childhood.

I admire Dr. Black's treatment of the girl Mary, but all our patients are not Marys. I also agree with what Dr. Ottolengui has said, that if a man does not love children he has no right to operate on them, because he can not accomplish the best results for them, but, Mr. President, I believe I love children as much as Dr. Ottolengui does, and there are some children whose teeth I can not fill with gold. I think, however, that the tendency of the profession is not always toward the highest class of service for their patients, and these papers stimulate men to do the best that is in them.

If I have one word of caution it is this: I have studied the nervous temperament of children as closely as any other factor in my practice, and sometimes in my enthusiasm to do permanent work I have come near to breaking down the confidence of patients, not in regard to the permanency of dental operations, but in developing a dread of dental operations. If we could have all these little patients drilled in the proper way at home we could have developed in them sufficient stamina so that the actual performance of a dental operation would not be a serious matter to them. I sometimes think the discipline of these children under such men as Dr. Ottolengui and Dr. Black, and men who take an interest in children, is the most beneficial part of the whole dental service.

Live up as nearly as you can to these high ideals, but look so broadly at the whole question that you do not allow your desire for high ideals to break down the nervous constitution of the patients you are trying to serve.

If you have drifted into slip-shod methods of operating take this paper and believe every word of it. As Dr. Black has intimated, there is a lack of confidence on the part of the public as to the benefit of dental operations, simply because a great many of them have been temporary.

My method is this: If I can secure the proper conditions in the mouth, and if I can so control the patient that I can get a perfect mechanical operation with gold, without jeopardizing the nervous condition of the child, or creating a dread of dental operations I will put in gold every time. If I come to the conclusion, after studying the characteristics and temperament of the child that by attempting to do that kind of work I am creating a dread of operations in that child, I shall put in a temporary filling every time, and I shall tell the patient and the patient's parents that it is a temporary operation, and I shall set a definite time when that patient is to come back to the office for examination. If by that time I can do permanent work I will do it, and if not I will repeat the temporary operation rather than jeopardize the nervous system of the little child. We are not justified in putting off the permanent operation longer than necessary. I think that is the plea Dr. Ottolengui intends to make.

I want you to read this paper carefully. After all it is largely the ability to manage the patient rather than the ability to fill the teeth.

Dr. D. M. Gallie:

Mr. President—The old bones of this institution have been getting severe jars in the last two or three weeks. A gentleman journeys all the way from New Orleans to tell us that we can immediately fill putrescent root canals. Then we received another shock by the title of the paper, but not such a shock after listening to the paper and being told that children's teeth should be filled with gold. The shock is not so severe tonight, because Dr. Ottolengui is getting to think about the same way we think. This is his third journey here. If he makes a couple more I think he will be practicing dentistry the way the dentists of Chicago practice it. He tells us he fills teeth with gold if the conditions are favorable. We too fill them with gold if in the condition he describes. Often through ignorance, and the impression that it is a deciduous tooth the first permanent molar is allowed to go until there is almost pulp exposure. The question is not whether it shall be filled with gold, amalgam or asphalt. The question is to save that pulp, and whether we shall do it by handling it gently, or take chances on destroying the pulp by inserting a gold filling.

Dr. Ottolengui leaves a great big aperture out of which to crawl. He tells us that he fills teeth so and so, but if the teeth are so and so he fills with gutta percha. So do we. I know what a sharp tongue Dr. Ottolengui has. He has a tongue sharper and keener than a stiletto and he has the last word tonight, so even if his paper were such that I could criticise it I would hesitate to do so because I know how he would make me look in print.

I think most of us are filling bicuspids with gold, but I do not hesitate to fill some of those teeth in the little folks with amalgam because amalgam today is better than it was years ago, and more reliable. We know better what to expect from it. I do not hesitate to fill the tooth with cement or gutta percha if need be, to tide it over, but to say that we can fill all teeth with gold, or that the dentist that can not fill a child's tooth with gold is not a good dentist I think is rather a broad statement. There are some patients you and I know who have teeth that it is almost impossible to fill with any material.

There is nothing that I can take exception to in the paper except the question of filling gold in the narrow slot cavities. In regard to filling children's teeth with gold Dr. Ottolengui does the same as we do, when conditions permit, but unfortunately cases of that kind are rare. If we have a family to take care of and can look after the children's teeth from the time the decay first shows itself, then it is possible for us to care for those teeth as Dr. Ottolengui has suggested. We are not always permitted that privilege. Instead the first molar, the one we want to care for so well, comes to us almost beyond redemption, and the question is to save the pulp until the tooth is fully developed, and then no matter what you use provided the cavity is prepared thoroughly and carefully and filled conscientiously, I think we are doing the best service it is possible for us to do.

Dr. Chas. P. Pruyn:

Mr. President: Our friend from New York in dealing with cavities confines himself to ideal conditions. As just stated by the previous speaker we seldom find ideal conditions in actual practice. Then what should we do in cases of extreme decay in the occlusal surface of molars. Is it proper to take a weak and anemic child and subject it to the strain that you would subject a strong adult to? That is where we have been making a great mistake. We are too apt to be near sighted, and see only the teeth upon which we are working.

I remember very well the instruction that was given us in medical college by the president of our institution. He said: "Gentlemen, don't be machine doctors. Don't think that there is a specific for any particular disease. There are no specifics. Always study these three things: First, the condition of the part, then the condition of the blood, and then the condition of the nervous system, and upon those three make a diagnosis and prognosis." Excluding those we become machine doctors. Let us try to adapt ourselves to the conditions as we find them. Let us be eclectic and let us use plain common sense in our practice, and not try to cast every particular case in the same mold. Gentlemen, it can not be done, notwithstanding the glorious statements of our silver tongued orator from New York. We know that these ideal conditions are not found in practice. Let us meet the conditions as they do exist, and meet them with gold, amalgam, cement or gutta percha. Don't be machine doctors.

Dr. Henry L. Banzhaf, Milwaukee:

Mr. President—I want to compliment the essayist upon his manner of treating this subject. To say that all cavities in the permanent teeth of children should be filled with gold is in my opinion a rather heroic statement, and in most hands would prove heroic practice. We all know that the treatment of children's teeth is largely a matter of conditions and temperament. We know that temperament is the result of heredity, with all that that means, so far as previous environment is concerned.

After listening to the reading of this paper for five or six minutes I concluded there were several points on which I would take issue with our essayist, but after listening further I decided that he has beautifully qualified his statements. I approve heartily of the upward tendency of the paper. It sets a high standard and so long as we exercise good judgment in the matter we will not go so far wrong. I am sorry there hasn't been more criticism. I like criticism. I am frank to say that I do not fill all cavities in the permanent teeth of children with gold. I believe the materials at our hands may all be used, if used properly.

In conclusion I would only say to my friend, Dr. Ottolengui, what the little boy said to his mother when she asked him what the text of the Sunday school lesson was. "Don't get scared, you'll get the quilt," which was his interpretation into the vernacular of the text from scripture, "Fear not, the Comforter shall come." (Laughter.)

Dr. John Q. Byram, Indianapolis:

Mr. President—George Ade says all good men come from Indiana, but they get out as soon as they can. I get out as often as I can and come to Chicago.

If I had had the experience of my friend Dr. Black, or were possessed of the keen tongue of my friend Ottolengui, or had the eloquence of my friend Johnson, or the wit of my friend Gallie, I would feel that I might be able to discuss this paper. I am reminded of a friend who discussed a paper read by Dr. Geo. E. Hunt last summer on the care of children's teeth, in which he criticized the doctor for writing on that subject, because he had no children. Dr. Ottolengui comes out here to tell us how much he loves children, and all that, but of course this love is for other people's children.

When patients come to me with amalgam fillings that have been inserted for fifteen, twenty or twenty-five years I still believe that there is some good in amalgam. We all agree that gold is the best filling material for cavities in permanent teeth of children, provided the children are placed in our hands at the proper age. You will observe that our friend took particular pains to deal with six cavities in the occlusal surfaces of the first molars, two in each of the upper first molars, and one in each of the lower first molars. That would be the ideal condition, I grant you, but how many of us are able to have our patients just at our finger's end? He did not say a word, as I remember the paper, of the proximo-occlusal cavities which we see developed. Had he gone on and given us a system of prophylaxis along with the method of obtaining these children at six years of age, and filling these small cavities, and preventing cavities from forming on the proximal surfaces, then I think he would have given us an ideal condition, but down in Indiana where we have a peculiar kind of water, we find all cavities do not form on the occlusal surfaces, and many of them almost involve the pulp before we have the little patients placed in our care.

Now, Mr. President, we know that gold is the best conductor of thermal changes of any of the filling materials, and we know that with our young patients the primary object is the conservation of the pulp of the tooth until the roots are thoroughly developed. We know that in many cases if we fill the larger cavities with gold it means the death of the pulp. This is true with adults, however, as well as with children. He did not tell us what he does in those larger cavities except he said in some he would insert inlays. I infer that he would keep them filled with gutta percha year after year until the tooth is thoroughly developed, and the pulp has receded to a point where he can fill it with gold. Why fill that tooth with gutta percha year after year when something else would be more permanent?

After all, we are of one accord. If we get a cavity at the proper time we believe it should be filled with gold. If it is a large cavity we believe a gold inlay should be placed there, and I believe we are all agreed that in extreme cavities gold is not the best material.

I am somewhat surprised to hear Dr. Ottolengui make some of these statements, for only a few years since he was an ardent advocate of porcelain, so I presumed he was filling all of the large cavities with porcelain. I am glad he has come back to earth and is using gold.

Dr. C. R. Taylor, Streator, Ill.:

Mr. President--I can in a way acquiesce in almost everything Dr. Ottolengui has said, since there is such a latitude in the time of the eruption of the adult teeth of children. The first molar is erupted at about the sixth year and the second bicuspid at about the twelfth year; besides I'm quite a kid myself, just taking my first dancing lessons, and I'm sure most of my teeth could be filled with gold. (Laughter.) The subject of Doctor Ottolengui's paper does not comply with its substance. I expected and think from the presence of this magnificent audience, that they expected him to tell them how to fill *children's* teeth with gold and not how to fill the adult teeth of children with that material and not the simplest cavities of such teeth at that. When I read the title of his paper I thought of our friend from Fort Wayne, Ind., who a few years ago crowned children's teeth with gold, and that Dr. Ottolengui would show how all the cavities of children's teeth can be filled with gold.

The doctor has anticipated any discussion of his paper by warnings, by classifications of those who may differ from him, which practically are knock-out drops to any one who may criticise his subject matter.

I could not help but think of what Dr. Gallie said about slot cavities, and I can appreciate why one of the wealthiest ladies in New York said she wanted to have one of these T-rail fillings put in her daughter's teeth. (Laughter.) I don't know whether you are laughing at me or Dr. Ottolengui, but I have no doubt at all in my own mind but that he will finally confess that she wanted to have that kind of a filling put in because that is the kind of rail they have on the New York Central, and Dr. Ottolengui evidently knew his business and wanted to satisfy his client with the form of filling that was used for rails on the husband's road. (Laughter.)

Now, seriously, there are other materials for filling the cavities mentioned in the paper, that have not been spoken of tonight, and I see smiling back there the man who has given us an excellent material to use in such incipient cavities where the children are seven or eight years of age. I am sure Dr. Ames will confirm anything I say about oxy-phosphate of copper for filling sulci in first molars by simply drying these cavities out and filling them with oxy-phosphate of copper that will last for years without the use of an instrument of any kind unless it be a small probe to remove particles of food, and alcohol and chloroform to dry out and dissolve any fatty substances in the sulci. The oxy-phosphate of copper can then be flowed into the sulci of the defective tooth.

DR. ARTHUR D. BLACK:

Mr. President—The last time that Dr. Ottolengui was here I think it was stated that he should have been a lawyer. Tonight I am of the opinion that he should have been a headline writer for the *Chicago American,* because from the headlines of his paper we expected to hear an argument as to why the teeth of children should generally be filled with gold. We find first that the argument is limited particularly to the four first molar teeth. Then we find it is limited further to the occlusal cavities of those teeth. Then we find it is further limited to two little occlusal cavities in each upper molar, and one little occlusal cavity in each lower molar. We find that those cavities should be so small that a small explorer will scarcely enter them, and after that we find that there should be just enough decay to justify us in making a cavity. Why should we not carry it one step further and if there is a deep pit fill it before it decays?

As a general proposition we must all agree with him that those little cavities should be filled with gold, and I believe many of us do fill them with gold. No matter how large the cavity is, if conditions are right, we should fill the tooth with gold. If conditions are not right then we should do something else. To my mind the control of the child is the all important thing in the filling of the teeth, and no one man is going to be able to control all the children that come to him. We will each of us get children that will be managed better by some other dentist. We must study each child as a proposition in itself. I have two patients, a boy of eight years, and his sister, who is fourteen. The boy's teeth I have filled with gold, but I have not been able to fill the sister's teeth with gold because she is of a more nervous temperament. While she has perfect confidence in me her teeth are so sensitive that I can not prepare the cavities properly to enable me to make good gold fillings. I have used the oxy-phosphate of copper cement with excellent results in children's back teeth. I dislike to call the oxy-phosphate of copper a cement, because it ought not to be in the same class with the zinc cements. It sets so much harder, and if it is not polished the surface wears slick and hard, so that it is entirely different from any other cement, and I would recommend it to those of you who have not tried it.

Dr. J. W. Wassall:

Mr. President—The problem is one that presented itself to every one of us at the commencement of practice, and each must solve it in his own way.

Dr. Ottolengui advocates a method which is successful, but which one can find fault with. It is a method that I, myself, abandoned fifteen years ago, for the reasons that have been given by the gentlemen who have preceded me. I find that it is better to postpone attempting permanent operations even when small cavities are to be dealt with. I find that with the erupting first molars it is very much better not to attempt to make gold fillings, but to wait until three or four years later. The essayist's method can be successfully used in special cases, but that is no reason why it should be given general application.

Dr. Ottolengui is more successful in handling these little people than the average man. He admits it himself. For the general run of practitioners it seems to me that the practice advocated is not good, and I do not believe that it is generally followed.

I think it has been a good thing for all of us to have Dr. Ottolengui come out here and stir us up.

Dr. T. W. Pritchett, White Hall, Ill.:

Mr. President—I am pleased to be here, but I don't think I can go the gait. However, I will say a few words. I am delighted to see and hear Dr. Ottolengui of New York City, being acquainted with him only through reading the dental literature. Believe I have read this paper two or three times before, and quite agree in the main with the practice advocated by the author, as restricted and limited by him tonight. I like him for it, yet like him more for another reason. When that prince of men and master of prosthetic art, Dr. Bonwill died—too little appreciated while living by the dental profession—Dr. Ottolengui and a few others, among them Dr. Broomel, of Philadelphia, did put upon record the too long deferred acknowledged merit due him as being the *master articulator* of artificial dentures. I honor him and them for what they did to preserve the good name and fame of Bonwill.

Dr. G. W. Dittmar:

Mr. President—I agree with Dr. Ottolengui in the way most of the previous speakers have agreed with him; that is, that gold is the proper thing for some children's teeth.

More especially do I endorse what Dr. Pruyn said, in short, to take into consideration and master the conditions we have to meet. Children are not all alike; the health and physical resistance of children differ. Their teeth are not the same in form and texture. The extent to which caries has attacked a tooth, the sensitiveness of the cavity, the age of the child, etc., all have a governing influence in deciding what is best to place into that cavity.

We must especially consider the peridental membrane. The charts prepared by Dr. C. N. Pierce and also those of Dr. G. V. Black show that the root of the first permanent molar is not fully developed until about the ninth year.

In a child seven or eight years old what is the condition of the first permanent molar root? It is likely not more than three-fourths developed; yet Dr. Ottolengui would, regardless of the small size of the pit cavity, in a lower molar for instance, extend that cavity, mesially and distally, buccally and lingually, cut out the fissures and get retention and then with his electric mallet not only condense gold into these but build it well up beyond the cavo-surface angle, filling the fossa to the extent permitted by occlusion. This large mass of gold is well condensed; it is done, as the essayist said, intending it to last a lifetime. I ask will this peridental membrane stand it?

The texture of teeth was mentioned. There is no doubt that the enamel of the first permanent molar in a child seven or eight years of age is hard enough for a skilled and capable dentist to condense gold against, but unfortunately all are not so capable and skilled.

Though Dr. Black in a long and carefully conducted series of experiments found practically no difference in the chemical composition and resistance to crushing stress of the enamel of teeth of various ages, nor in the so-called hardness of the enamel, and if my memory serves me rightly, he found about as much difference between the teeth of an individual as between the teeth from various individuals, ranging from young to old, yet I believe you will all agree that there is a change in the enamel which makes it harder as a person grows older.

Take, for instance, the preparation of a cavity in a first permanent molar of a child about seven or eight years of age; your burs and chisels cut the enamel easily compared with that on a similar tooth of a person forty or fifty years old, and while it looks logical that the chemical substance of the enamel remains practically constant, that is, no change takes place in it after it is first formed, for amelification is completed in a first permanent molar about the fifth year and after the tooth is erupted it receives no nourishment, yet the enamel, probably through a molecular rearrangement in the enamel prisms or desiccation—eliminating some of the water of crystallization—gets harder as age advances and consequently makes it safer for the thorough condensation of gold against it.

Just a word or two regarding dental nomenclature. I very much dislike the term "children's teeth." Why not call them, as we properly should, "deciduous teeth" or "temporary teeth," and call the others the "permanent teeth?"

Another term that has been used several times is "six year molar." I believe that we should call it the "first permanent molar" and the next one the "second permanent molar," and the next the "third molar," and so distinguish them from the deciduous or temporary teeth.

Dr. Black advised Dr. Ottolengui to throw his round burs into the North River. That statement rather surprised me.

I can not get along without round burs. I finish the cavity preparation with square ended burs; fissure and inverted cones; but the major part of the cutting I do with round burs principally because I can do it with a great deal less discomfort to the patient.

Dr. E. M. S. Fernandez:

The text of the paper, I believe, is "Why and How Children's Teeth Should Be Filled with Gold," but the reading of it refers to the permanent teeth of children, therefore it seems to me that in the text the word permanent should be inserted between the words "children" and "teeth," so it would read, "Why and How Children's Permanent Teeth Should Be Filled With Gold."

I do not know whether I love children or not, but I do know that when they come to me for their dentistry, I love to do my duty by them.

When I am to do dental work for children the first thought that comes to my mind is "What shall I do to save their permanent teeth permanently"? considering at the same time the importance of saving their nervous system and health.

I wish to say here that such papers as Dr. Ottolengui has read to us are papers which we need very much because they distinctly remind us that we have a duty to perform and that duty is to do dental work for the future and not for the present only.

If my opinion or advice were asked in regard to using gutta percha as a filling in children's teeth I will say emphatically, don't use it. If you want to satisfy yourself about my reason for saying this all you have to do is to take out one of these fillings after it has been in the cavity of the tooth for three months or so and smell it.

I believe that rather than use gutta percha I would prefer to use as a filling the material that is used as a sealing while the cavities are under treatment.

Coming back to the subject again I will say that I believe gold fillings should not be used too freely in all permanent teeth of young people. It seems to me that the practice of inserting well malleted gold fillings in the permanent teeth of very young people compares very materially with the erecting of heavy walls of buildings on foundations that are not yet finished and set hard. During thirty-two years of experience in dentistry I have tried to do honorable work in my profession, dealing carefully with children's teeth, and I will tell you the conclusion I have come to.

I clean the cavity of a permanent tooth as well as the child will allow, without forcing him into a condition of nervousness. After rendering the cavity dry I paint it with 95 per cent carbolic acid, and after drying same I fill it with oxy-phosphate of zinc cement.

In my experience such filling made in that way will usually last one year and sometimes longer.

By this process each time the tooth is nearer to a first-class piece of permanent work and when conditions are favorable I can insert a permanent filling in a cavity that has been treated that way with less pain and nerve strain to the child.

I have done permanent work in young people's teeth, without the use of this preliminary cement work and found that in some cases the nerve strain to the child made it difficult to have them submit to any further operations.

Dr. Fred B. Noyes:

Mr. President, there is one point in the paper it seems to me which is capable of legitimate criticism, and that is, as to whether the margin of the cavity should be trimmed to the point where the gold stops or whether the gold should be built upon the slope of the cusp.

The essayist advises the cutting of a very narrow cavity and then building the gold up beyond the cavity outline. The reason given for it was that by so doing the enamel which formed the margin of the cavity was supported not only by the filling material, but by a portion of solid enamel. In that the essayist has recognized one of the fundamental principles, that the enamel which forms the margin of the cavity should be supported not only by the filling material, but by enamel rods which rest on sound dentine and are covered in by filling material. In carrying out this preparation he gets a very thin margin of filling material in that position, and that is recognized as a weakness. There is more tendency to tip on account of the thinness. I would say that in the preparation of these cavities, if you bevel the enamel to the place at which the gold is to stop and finish the gold down to the point where your beveling stops, you will have produced the strongest enamel wall and the strongest gold margin.

One suggestion regarding the peridental membrane. It is very much thicker in young teeth and the length of the fiber is very much greater. The tooth swings on a longer support, and it requires a great deal more force to properly condense the gold in young teeth than it does in older teeth, because so much of the force is taken up by the sag of the fibers. That sometimes accounts for the failure of gold fillings in children's teeth.

Dr. Ottolengui, in closing the discussion, said:

I came to the city of Chicago where I knew there were slaughter houses, but the good book says that after death there shall be resurrection. Starting in with Dr. Black I want to say to him that I am not going to throw away my round burs. I do not think that Dr. Black remembers that I spoke of the tiniest round burs made, and I was speaking of small cavities. Where it is necessary I have a few flat-end burs.

I never hear Dr. Johnson speak without thinking that if he were in the ministry I would join his church. Dr. Johnson unfortunately did not read my paper or he would not have thrown that little gibe at me about not being a busy dentist because I fill children's teeth. The busy dentist is that one who has no time to read a magazine. That is the man I meant when I referred to the busy dentist. I have no patience with that kind of man and would not tell him anything if I knew it. Dr. Johnson is always an inspiration to me, and after hearing him I wrote down another epigram. Dr. Johnson said that there are children whose teeth should not be filled with gold, but they should be temporized with. True. This is my epigram: There are no children whose teeth can not be filled with gold while they are yet children.

In regard to Dr. Gallie I do not want to take advantage of the last word. I can only say that I am glad to find his practices are much better than I thought they were.

Dr. Taylor got off two jokes on me. He said that the wealthy party that was going to have me put T-rail fillings in her child's teeth must have been the wife of a railroad man, and he mentioned the New York Central. He is very nearly right; it is the Mexican Central.

Dr. Fernandez I know won't mind what I am going to say because I say it honestly. I believe Dr. Fernandez is a fine dentist for some people, but not for children. He says he doesn't love children, but does his duty by them. That is impossible. You can not even suspect your duty if you don't love them. It is not only the question of saving particular teeth but it is the education of the child, to keep the teeth clean and having them filled without waiting for fifteen cavities to appear. I fill with gold, and never in my life have I filled a child's tooth with amalgam.

I want to speak about Dr. Noyes' diagram. In the first place, Dr. Noyes misunderstood me. I stated that in this sort of a cavity the enamel border is better protected from masticatory stress if there is that much beveling of gold between it and the stress of mastication. I do not care about the enamel rods. It is not the proposition with me whether you cut that way or not (illustrating). There is a perfectly clean surface that is going to take care of itself. It is the exposure of the actual contact between gold and enamel margin that

I want to avoid. I do not say that you are bound not to have a recurrence of decay there—not at all. Often you must have the gold and enamel margins exposed to the forces of mastication, but I am not going to make it so if I can help it because I have had no failures when the gold is extending over the margin, whereas I have had many failures when the margins were exposed to stress. If you put gold in right it will not flake away. I keep the cavities as small as possible for the reason that I do not want the gold to get down near the pulp.

THE DENTAL REVIEW.

Devoted to the Advancement of Dental Science.

PUBLISHED MONTHLY.

EDITOR: C. N. JOHNSON, M. A., L. D. S., D. D. S.

Subscription price $1.00 a year including postage, to all parts of the United States and its possessions, Cuba, Canada and Mexico. All other countries $1.75 a year.

EDITORIAL.

THE CAUSE OF EROSION.

There has been much conjecture as to what causes erosion of the teeth, and the problem is still unsettled, but there seems to be an occasional ray of light coming in to illuminate the subject, and we take great pleasure in calling the attention of our readers to the article of Dr. Geo. W. Cook in this issue. Dr. Cook has been studying this subject most carefully for many months, and while conservative in his claims, yet he feels that he is on most promising ground for the ultimate solution of the problem. We have personally examined his specimens and can vouch for their similarity to cases of erosion occurring in the mouth. It will be a great gratification to the profession if Dr. Cook succeeds in establishing the etiology of this disorder, and we commend his work to the careful consideration of pathologists in this line of research. Of one thing we are assured—that Dr. Cook is following a line of study which must result in much ultimate benefit to dentistry, whether he solves the erosion problem or not, and that the profession are deeply indebted to him for his painstaking care in the infinite detail of the work he is now engaged in.

ARMY AND NAVY LEGISLATION.

The Committee on Legislation of the National Dental Association have been actively engaged during the present session of Congress urging legislation to improve the status of the dental corps.

The profession should stand loyally behind any movement calculated to advance the interests of better dental service in the army and navy, and to provide for an adequate recognition in grade.

But in the bill at present before Congress it is claimed that there is one objectionable clause. Dr. Ottolengui, editor of *Items of Interest,* points out in his journal that one of the provisions in the bill would, if passed, work to the great disadvantage of Drs. Marshall and Oliver, the present examiners of the army dental corps. We are not sufficiently familiar with the question to express an opinion as to the merits of the controversy, but we are certain of one thing, that the profession generally will not countenance any movement calculated to injure the two men who have sacrificed so much of their private interests to place dentistry on an established basis before the government. Drs. Marshall and Oliver have proved their efficiency in actual service under trying conditions in the organization of the dental corps in the army, and no humiliation of these men must be permitted. We hope that the point at issue may be satisfactorily adjusted so that desirable legislation will not be jeopardized. That we need better legislation no one will deny, but it must not in any way work an injustice on worthy men.

A PERSONAL PROTEST AND WARNING.

It is seldom that the editor of THE DENTAL REVIEW introduces a personal note into the editorial pages, but in this instance there seems no other way of correcting a certain abuse than to take up the matter in a purely personal way. My name has been used so frequently and unwarrantably in recommending certain nostrums and office-right formulæ, and in the selling of certain commodities to dentists that I wish to place myself on record in such a manner that my position will not be misunderstood. On general principles and from a professional spirit I should never under any circumstances give a recommendation for a secret preparation, and I have persistently refused to give public recommendations of any sort, even in cases where I was impressed with the value of an article and was perfectly willing to recommend it personally.

My reason for this extreme stand against public endorsement has been largely brought about by the abuses which I have suffered in having my name used wholly without warrant for selling almost every conceivable commodity employed by the dentist.

Many years ago a man traveled through one of the Northwest states selling a certain kind of amalgam on the strength of the assertion that I was using it and endorsed it. I had never heard of the man nor his amalgam till a practitioner from that state casually remarked to me one day that a great deal of that amalgam had been sold through the state on account of my recommendation. Some time later another man in Missouri used my name in a similar connection with a new form of gold that I had never heard of. Last summer while returning from my vacation I changed trains at a little town far up in Northern Ontario and chanced to meet the resident dentist, who said to me: "By the way, I am glad I saw you. A man was here the other day selling a mouth wash which he claimed you used and recommended, and I would like to ask something about it." The name of the nostrum was entirely new to me.

The other day I received a letter from a dentist in California stating that a man was selling office rights for certain secret formulæ in that state and using me as a reference to endorse his concoctions.

This thing has got to stop. These are only a few of the many instances where my name has been used under similar false pretences to deceive the profession, and I cannot longer tolerate it. Why I should have been selected for such wholesale misrepresentation I am at a loss to know, unless the impression has gone out that I am so peaceably inclined as to permit it rather than have any contention. It is true that I do not like contention. I would sooner pacify a man any day than to fight him, but in the language of the famous Southern general, "By the Eternal," I *can* fight, and some of these fakirs will find it out if they persist in imposing on the profession in this way. It is sometimes difficult to get the names of these men, but I already have some of them and shall not hesitate to publish them if the practice does not cease.

THE EDITOR'S DESK.

MY SUMMER VACATION.

[Continued from April DENTAL REVIEW.]

THE MOUNTAINS OF BRITISH COLUMBIA.

I have never been so conscious of my descriptive limitations as I am now in taking up a pen to describe the ride over the Canadian Pacific Railway through the Selkirk and Rocky Mountains. The feeble word-painting of man can do little to portray so stupendous a panorama as nature has lavished upon this region. There is enough mountain scenery upon this one line of railway to supply all the roads of the earth and then have some left over for the ones that are yet to be built. I had no conception of real grandeur till I took this trip. I have been through the Thousand Islands of the St. Lawrence and the tens of thousands of the Georgian Bay, I have been in Ausable chasm and through the Alleghenies, I have marvelled at Niagara Falls and been impressed by the wondrous beauties of Yellowstone Park, and I am saying nothing in disparagement of any of them when I assert that in comparing these with the mountains of British Columbia they melt away into positive insignificance. No man has completely filled his soul with scenery who has not gone over this route. Whatever else he has seen there still remains this one grand and final climax. I am sorry for the individual who has never been through these mountains, and yet I envy him his first experience. Nor am I quite sure that the first experience is the best. It takes more than one trip to comprehend the tenth part of what is spread out before you. I was riding along with a gentleman who was in one of the survey parties which laid out the road. He went into the mountains with a fifteen-horse pack train before there was any kind of a trail and so he was surely familiar with the scenery, yet this man was standing out on the platform of the observation car walking from one side to the other and drinking in the grandeur as if it were all new to him. He said to me that the more one saw of it the more one wanted to see.

It occurred to me that it would be an excellent thing if a man could go through those mountains at least once a year for the psychological and moral effect, aside from the interest of sightseeing, for after all the chief benefit is upon the intellectual and motive forces of an individual rather than upon his senses. The awe inspired by those prodigious peaks standing solemn and grand against the sky is salutary upon the mind in this age of rush and fret when the myriads of earth are struggling and striving over the petty things of life and absorbed with so much that is narrow and morbid. It would be a strange individual indeed who after contemplating this marvelous manifestation of nature, sculptured in one of her loftiest moods, could stoop to anything small or mean. It sanctifies the very soul to study what the stupendous forces of nature have wrought in this region. She has sent the earth up in rugged piles to meet and blend with the very clouds of air, and left them standing as perpetual sentinels over the pigmy plans of man.

But to our trip. We awake in the morning as the train is skirting Shuswap Lake, a body of beautiful clear water, and soon arrive at Sicamous Junction where a line branches south to the Okanagan country. We then run along the Eagle River for a distance with mountains on either side, and just as we come to Revelstoke, at 9:10 a. m., we cross the Columbia River. The problem of building and maintaining a railroad up through these mountains has been a very difficult one and we notice that the road bed has been changed in many places to avoid snowslides, and to get a firmer track. In some instances the small mountain torrents have seriously shifted the tracks, and it is a question of constant vigilance to keep the road in order. But with all of these obstacles the roadbed is one of the very best, and in riding over it the marvel is how it can be kept so perfect.

At Revelstoke an observation car is put on, practically open to the roof on all sides, which gives an excellent opportunity of viewing the scenery. And it is needed. The height of some of the mountain peaks may be imagined when it is stated that from an ordinary car window they can not be seen to the top—in fact to try to look at all of the scenery we pass a man must have the proverbial rubber neck. The road up from Revelstoke runs along the Illecillewaet River, or as the trainmen call it for short, the "Silly-wit." It has many rapids and falls and makes a beautiful picture as it cuts its way down through the gorge. Here the train has some very steep grades and sharp curves, at times running very slowly. We see snow —snow—snow on the mountains, with glittering white streams tumbling down their sides. In some places the atmosphere is hazy, which increases the illusion of the tops of the mountains entering the clouds. The train is getting very heavy for the engine, which puffs laboriously up the hill, and so another engine is put on to push behind.

The Illecillewaet River.

At Albert Canyon the train stops to allow the passengers a view of the gorge with the river running 300 feet below, and immense peaks towering on either side. In many places where the road runs along the face of a mountain snow sheds have been built over the track to protect it against the avalanches which tear down the mountain side, and at one spot we run from a snow shed immediately into what seemed an interminable tunnel. We are divided in our amazement between the wonders of nature and the marvelous engineering feats of man. Between Revelstoke and Glacier the road crosses the Illecillewaet River no less than thirteen times and at one place in ascending a difficult grade it forms a double loop like the letter S.

At Glacier House, while it feels like summer it looks like winter. The track runs very near the Great Glacier, and to look out in August upon that immense mass of ice lying in the lap of the mountain with peaks on either side, and tiny rivulets trickling down its base, it seems a strange manifestation of nature. It is also at this point that we see Mount Sir Donald, a sharp and naked pyramid which rises to the height of a mile and a quarter above the railway. As the train runs along past Glacier the snow in the crevices extends down apparently near the track. The Collector, who is standing by my side, exclaims: "Why goodness gracious sakes alive, a person could *walk* to that snow!" Rounding into Roger's Pass the view is indescribably magnificent. The passengers for the most part are by this time not content to sit, but are surging from one side of the observation car to the other, with exclamations of constantly in-

The Great Glacier.

creasing emphasis. It seems such an exuberance of sight-seeing that the wonder is the eyes do not give out. Although there is plenty of air to breathe—and the purest of pure—yet many of them are holding their breath. And it is not a gaping, idle crowd, either, but a sane and eager body of men and women, stirred to their inmost souls and hallowed into reverence in the presence of this majestic spectacle.

And yet, shades of the incomprehensible, I stepped for a moment into our sleeping car and found a man stretched out on one of the seats sound asleep! At first I thought he must be dead—killed, as I supposed, by the overwhelming sense of infinitude about him—but no, the brute was breathing. Either that man has nowhere in his makeup the slightest pabulum of sentiment, or else he must fix up a pretty good story about where he was the night before if he wants to make me believe he is a decent citizen.

Mount Sir Donald.

Standing on one side of the car and looking down it seems as if the whole world must be beneath the train—it is so far down to the bottom of the gorge—and yet, on passing to the other side and looking up, it is found that the mountain towers still farther above the track. In one place you look out across a deep valley to a range in the distance apparently a hundred miles away, in another the opposite walled embankment seems almost to overhang the train.

The Natural Bridge, Field, British Columbia.

At times the mountain sides are thickly wooded, and as we ride along the bank is so steep below us that we look across over the tops of tall trees. Rushing down the green slope a foaming river cuts its way among the timber—while sometimes where the peaks are bare a beautiful cascade tumbles through a deep and precipitous groove worn in the mountain side. The Columbia River, which arched far to the north at Revelstoke, has again curved to the track at Beavermouth, and follows it to Golden. Here the road, apparently lonesome without a river, seeks companionship with the Kicking Horse River—a vicious, wicked stream, well named. This river is very rapid, running down Kicking Horse Gorge, and in places it has cut its way through the solid rock to a great depth, leaving a massive wall of nature's masonry on either side for many miles.

Coming toward Field the valley widens and the immense peaks in the distance look hazy and wierd in their dim outlines against the sky. Field is a beautiful spot and the run from this up to the summit is full of marvels. The ascent is very rapid and three engines are necessary for the climb. The sun is dipping down in the west, and as it floods the peaks they are glorified into many colors highly wrought. We see yellows, light grays, reds, and even blacks, and the brilliancy of the scene is only heightened by its sublimity and grandeur. What wondrous canvases nature has here spread out for the edification and inspiration of man! I thought of Kipling's poem about painting on leagues of canvas with a comet's tail for a brush. At the summit is a large rustic sign, "The Great Divide," where a beautiful stream is separated into two arms, one flowing to the Pacific and the other to Hudson Bay. It is here we leave British Columbia and enter Alberta, and as we say good-bye to the province which has done so much for our entertainment, it is with the firm conviction that never again, no matter where we travel on the face of the earth, shall we ever sojourn in any clime where the fates are more propitious for our happiness than they have been in this far-away land of the great Northwest.

(To be continued.)

DOMESTIC CORRESPONDENCE.

NEW YORK LETTER.

The Alumni Association of the New York College of Dentistry has entered the field of dental clinics and on St. Patrick's day, March 17th, at the college building in East Twenty-third street, held a very interesting clinic beginning at 1:30 p. m.

Some fourteen gentlemen operated. We noted especially Dr. S. G. Perry, of New York, on "The Conservative Preparation of Proximal Cavities for Gold Filling"; Dr. J. V. Conzett, of Dubuque, Iowa, on "Preparation and Filling with Gold of Proximo-Occlusal Cavity," and Dr. Nelson T. Shields, of New York, on "Removal of Pulp Without Cocaine." Immediately after the clinic Drs. Perry and Conzett read short papers descriptive of their clinics.

The New York Institute of Dental Technique, though young in years, is emulating some of the older societies right well.

During the month of March it held two meetings, the first being on Monday evening, March 19th, when Dr. J. V. Conzett, of Dubuque, Iowa, read a paper on "Contour Gold Fillings According to Dr. Black's Method," preceded by a clinic by Dr. Conzett, at 4 o'clock, at Dr. James F. Hasbrouck's office, 62 West Thirty-eighth street.

Its second meeting was the regular monthly meeting held at the "Chelsea," where the usual informal dinner was had.

The paper of this evening was by Dr. T. Ledyard Smith, of New York, entitled "Palatine Extension of Proximal Cavities in Incisors vs. Wedging," provoking quite an animated discussion.

The New York Institute of Stomatology held two meetings also. The first was on Monday evening, April 2, when Dr. Horatio C. Meriam, of Salem, Mass., read a paper descriptive of "Compound and Combination Fillings."

The regular meeting occurred on the following evening, April 3, preceded as usual by the informal dinner at the "Chelsea." The essayist was Dr. C. A. Hawley, of Columbus, Ohio, who presented an elaborate and interesting illustrated paper on "An Accurate Method in Orthodontia," which was discussed by many very eminent orthodontists of the East. Among them we noted Dr. E. A. Bogue, of New York, Dr. George C. Ainsworth, of Boston, Mass., Dr. R. Ottolengui, of New York, and Dr. Young, formerly of Detroit, but now of New York.

At 5 o'clock in the afternoon at the office of Dr. S. E. Davenport, 51 West Forty-seventh street, Dr. George C. Ainsworth, of Boston, demonstrated in detail the making of some of his most valuable appliances for the correction of malocclusion.

The Central Dental Association at its regular meeting in March, listened to Dr. John E. Nyman, of Chicago, on "Gold Inlays," in which paper he described his method exhaustively. Just at the present time this subject seems to be engrossing the attention of nearly all societies in the East.

The newly elected president, Dr. Joseph S. Vinson, of Newark, N. J., occupied the chair and acquitted himself well.

There have been some changes in the dinner committee, and for once the usual dinner where we all become so well acquainted was omitted and regretted.

The First District Dental Society held its meeting at the Academy of Medicine on Tuesday, the 13th of March. Owing to the failure of its essayist to be present and in lieu of a paper the time was devoted to a consideration of the merits and demerits of the gold inlay from the practical experience of many men.

Dr. S. G. Perry was the first gentleman to be called by the president, Dr. A. L. Swift.

He started to recount dental history far back in the early days of the use of gold as a filling material. I mean during the early lifetime of Drs. Atkinson, Varney, Webb, DeLos and Eugene Palmers and I might add Perry himself, Dwinelle and Dunning, all gold workers of unusual reputation. Dr. Perry said there has never been higher mark reached since than that attained by these men. In those early days it was a new field (gold), new inspirations actuated them and they obtained marvelous results, really ideal. We do not see anything like it today.

Their struggle was for perfect adaptation (using soft gold), perfect contour, perfect condensation. When porcelain came we were all enthusiastic; threw up our hats and shouted—at last we have what we have been looking for, but have we?

"Gold is still our standby if we know how to use it. I doubt if we will ever find anything better than gold for saving teeth. Don't let us lose our heads with these other things. They are all good and have their place."

The foregoing remarks by Dr. Perry were only preliminary to a lengthy discourse. He finally spoke of some of his first attempts at inlays. They consisted in setting of loosened fillings with cement in the cavities from which they loosened; as a temporary expedient, of course, but they lasted so well they were never removed. So he has naturally been sympathetic toward the present inlay.

Could there be any more beautiful work than the restoration to seeming perfection of tooth structure in the human mouth by porcelain inlays?

As to gold inlays, they have great advantages in saving time, labor and patience, but the great disadvantage of any inlay is the sacrifice of so much tooth structure.

Finally Dr. Perry proceeded to describe his method of making gold inlays. The cavity is prepared in the usual way. He then takes a good sized lump of crystal or mat gold, places it into the cavity, patting it lightly. There must be considerable surplus so that the patient may upon biting into it compress the surface and thus represent proper occlusion. The proximal surface is lightly gone over with a burnisher. The mass is gently removed and eighteen karat solder is melted into it. "It drops to the base as water would run through a sponge." It is subsequently finished on the exposed surfaces.

Dr. John I. Hart was called upon to describe his method. It consists of burnishing the matrix of gold, taking the contour in impression compound, swaging contour piece, and soldering the parts as described by Dr. Nyman, of Chicago.

I neglected to say that Dr. Perry described another method of protecting the cement in these large cavities which it is always conceded to be the function of the inlay or restoration. It consists of a twenty-four karat piece of plate 34 gauge which is cut and shaped to form contour and overlaps the edges of the cavity. Ordinary pins are then soldered to the inside, the whole finally being set with cement.

Dr. H. W. Gillett in speaking of these called them Dr. Perry's overlays instead of inlays. It was a surprise to many to hear Dr.

Gillett say that he had not the patience to make large gold fillings any longer, nor will his patients tolerate the strain. They are blessings when made right, but there is going to be about a ton of awful gold inlays in about a year. But that is not derogatory to the inlay. Those same men can do no better with amalgam or gold or porcelain or anything they use.

Dr. R. M. Sanger spoke of the inlay for use at one end of a bridge.

Dr. F. T. VanWoert's remarks are always of much value on these practical points, for he started his career studying dynamics and in a machine shop. He said that in dynamics the struggle is to make something to fit.

The true inlay is only a cover to a box; the true filling is the cement. Our aim should be to make that cover absolutely fit the box, and the easiest way out of that is the best way. There is one man who has solved the problem in Dr. VanWoert's mind better than any other, whom he denominated as a genius and whom we must all follow soon. "I was skeptical but was obliged to accept his methods and sing his praises. That man is Dr. Taggart, of Chicago."

Dr. Dills followed, describing Dr. Taggart's method, which you all know.

The First District Society re-elected as officers for the coming year its whole board of the past year. An opposition ticket developed during the last forty-eight hours which set the telephone wires in town humming. The society's constitution is very defective in its provisions for nomination of officers. It provides that regular nominations be made at the March meeting, but permits of other nominations and they need not be made until the night of election. The opposition took advantage of this. They very carefully canvassed the situation, so they thought, and got pledges of a majority of votes. When the ballots were counted the regular ticket elected Dr. A. L. Swift by twenty-eight majority. The other officers are Dr. James W. Taylor, vice-president; Dr. Benjamin C. Nash, secretary; Dr. Herbert R. Armstrong, treasurer; Dr. M. C. Tracy, librarian; as delegates to the State society for four years each, Dr. William B. Dunning and Dr. Louis Nash. Sincerely yours,

THE BOROUGHS.

PRACTICAL HINTS DEPARTMENT.

EDITED BY G. W. JOHNSON, D. D. S.

[This department is for busy readers. We want short articles containing practical ideas—the shorter the better. No article must exceed 200 words, unless of exceptional merit. Every dentist has some useful hint that has been of value to him, and if he will only put it in print it may be of equal value to others. That is what this department is for. Due credit will be given for every article sent. Address G. W. Johnson, THE DENTAL REVIEW, 55 State street, Chicago, Ill.]

Protection for Facings:—To prevent "etching" of facings when using 20 per cent platinum solder, paint the surface with a creamy solution of carbonate of magnesium before investing.—*A. E. Matteson, Chicago.*

Attaching Vulcanite to Metal Plates:—I have found that pink rubber will become attached to a metal base more securely than will either red or black rubber. I have since discovering this fact, used it altogether, and it separates but seldom, especially when studs or loops are used.—*C. N. Thompson, Chicago.*

Backing for Facings:—A very satisfactory backing for facings is obtained by using 1-1,000 platinum, doubled and burnished to the facing. I'ts advantages are: Adaptability to the facing, less likelihood of burning the backing while soldering, and reflection of color through facing.—*Henry C. Lee, Chicago.*

"Taking a Bite":—In taking a bite I request my patient to press the tip of the tongue tightly against the posterior border of the trial plate, impressing upon him the importance of keeping the mind on this procedure. After that I ask him to close the jaws. The resultant bite is almost always correct.—*Hugo Franz, Chicago.*

To Prepare the Floor of the Cap for a Porcelain Crown:—Puncture the floor of the cap from the root side with a pointed three-cornered instrument. A puncture thus made turns up a burr on the porcelain side, which becomes firmly imbedded in the body of the piece and is fully as retentive as a headed pin in the facing.—*L. A. Arnold, Chicago.*

Treating Cavities with Nitrate of Silver:—I believe it is a good practice when you have some evidence of a superficial decay to touch it with nitrate of silver and see how deep it will go. In a few weeks that will show you how far the area of decay has gone. Lots of times you need not go any further, as that will stop the decay.—*J. N. Crouse, Chicago.*

A Case in Practice:—I had a case where a third molar was forcing itself against the distal surface of a second molar, and in so doing it caused some erosion, or absorption thereby. I prepared the root of the second molar for crowning and the preparation of the root made sufficient space for the crown to be adjusted. I waited a short time for this malposed third molar, and it came properly into position.—*J. R. Knapp, New Orleans, La.*

Immediate Root Filling:—A number of years ago I was a great advocate of immediate root filling and did a great deal of work in that direction. Years afterward, in taking off crowns, or where I wished to change the work, I found that where I had employed the method of immediate root filling, the fillings were foul if I drilled into them, because I did not treat the tubuli, but simply disinfected and filled the canals and pulp chamber.—*George W. Whitfield, Evanston, Ill.*

Method of Removing an Unbaked Inlay from the Cavity:—In a recent operation where I used Roach's Opaque Dental Porcelain in a posterior tooth I lessened the difficulty of removing the inlay from the cavity by imbedding in the center of the unbaked inlay while in the cavity, a small and fine piece of platinum wire, which I used as a handle to remove it by. When the inlay was baked and cemented to the cavity I cut off the wire with a sharp steel instrument, the wire being so fine that it did not show in the inlay.—*E. M. S. Fernandez, Chicago.*

Mouth Breathing:—Children naturally take to soft foods. I do not know why, but they do, and they need other foods not only for the sake of preserving their teeth and cleaning them, but for the purpose of aiding development. Mouth breathing may be largely counteracted by the development of the muscles of mastication, which in the time of sleep will keep the jaws closed, while weak muscles, which are never used in mastication, constantly relax during sleep, and the mouth is bound to drop open.—*Fred B. Noyes, Chicago.*

Skiagraphs as an Aid in Crowning Roots:—Drilling into roots for the purpose of inserting posts for crowns is most treacherous work. Where advisable, we drill a certain distance only, insert a post, and skiagraph and then we learn whether or not we are drilling in the right direction or are dangerously near the apex or side. Again, whether or not a root is sufficiently strong to warrant crowning is sometimes a matter of doubt, and under these circumstances we skiagraph the case, and upon the results shown we base our conclusions.—*C. Edmund Kells Jr., New Orleans, La.*

Disinfectant for Instruments:—A good, cheap disinfectant for your instruments or to whatever use you wish to apply it, is found in Lysol. It is a pure cresol product, containing the highest percentage of cresylic acid in a soluble and free state. It is a permanent preparation, non-toxic, makes a clear solution in water, is superior to carbolic acid and creolin as a bactericide and is less poisonous than either. A two per cent solution is equal to a five per cent solution of carbolic acid crystals. Lysol is suitable for general disinfection as well as for medicinal uses.—*H. E. Davis, St. Joseph, Ill.*

Selecting Shades:—When we are studying a tooth for the purpose of selecting shades, the patient should be in an upright position. I have noticed that if the patient is reclined so that the light strikes at an angle the teeth seem much lighter than they really are. This study should be made early in the operation before the teeth have been allowed to dry, as this always bleaches. In handling the shade guide we should remember that the body in an inlay will be much thinner than the specimen in the guide, and consequently much lighter, hence a darker color should be selected than is desired in the inlay.—*J. O. Wells, Minneapolis, Minn.*

Constructing Porcelain for an Inlay:—In the selection of colors for an inlay note the variations in color of the natural tooth. There are usually three or more colors, or shades of colors, in a tooth. The foundation of an inlay, representing the dentine, should be yellow (presuming that the tooth is vital), and the overlying colors should approach the color of the enamel in their respective positions. I believe the method of constructing inlays of two bodies differing in fusibility to be the correct one. The foundation body can be thoroughly fused, and when the enamel colors are placed in their respective locations and fused, the two porcelains give a more natural combination of color than can be produced by a single body.—*J. Q. Byram, Indianapolis, Ind.*

Evils Incident to Use of Dam:—In the following operations the dam may be omitted for hygienic reasons, comfort of patient, economy of time, clearer view of the case, and for other advantages not here mentioned: (1) Opening tooth for ventilation of abscess, evacuation of pus, cleansing of chamber, canals, etc. (2) Removal of putrid matter or whatever should be removed from cavities or canals already exposed to the fluids of the mouth. (3) Cleaning of enamel and removal of filth and decalcified dentine—in short the greater part of the preparation of all cavities. In these cases a stream of tepid water cleanses the field of operation, dissolves or absorbs fetid and volatile matter, removing the whole to where it can no further offend and incidentally cleansing the mouth to the advantage of patient and operator. A self-filling syringe renders this use of water quite convenient. Where a dam is used the foul infectious poisonous contents of the cavity are evaporated by blasts of air and when cut to dust are puffed out to the immediate contamination of the air breathed by patient and operator. Filthy dust of this kind once raised is distributed to everything in the room. It is not easily removed and so remains a menace to the health of operator and patients. It would therefore seem well to avoid the dam and dust-blowing where it is not essential to correct work.—*W. C. Gowan, Creemore, Ont.*

MEMORANDA.

PENNSYLVANIA STATE BOARD OF DENTAL EXAMINERS.

The Board of Dental Examiners of Pennsylvania will conduct examinations simultaneously in Philadelphia and Pittsburg, June 5-8, 1906. Apply to Dr. N. C. Schaeffer, Secretary Dental Council, Harrisburg, Pa., for papers and particulars.

THE IDAHO BOARD OF DENTAL EXAMINERS.

The Idaho Board of Dental Examiners meets in Boise, June 13, 14, 15, 1906, for the purpose of examining applicants for license to practice dentistry in Idaho. Second day devoted to practical operative dentistry, applicants furnishing instruments and material. C. E. M. Loux, *Secretary,*
Pocatello, Idaho.

THF ORTHODONTIA CLUB OF IOWA

Will hold its second meeting in Des Moines, May 4, 1906, the day following the meeting of the State Dental Society. If you are interested in Orthodontia we extend to you a most cordial invitation to be present.

W. J. Brady, *President.*
H. D. Keeler, *Secretary.*

ALUMNI ASSOCIATION OF THE DENTAL DEPARTMENT OF WASHINGTON UNIVERSITY.

The Alumni Association of the Dental Department of Washington University (Missouri) Dental College will hold their annual clinic in the College Building, Twenty-seventh and Locust streets, on Tuesday, May 22, 1906. Address all communications to Dr. F. B. Lynott, Frisco Building, St. Louis, Mo.

Dr. B. N. Pippin, *President.*
Dr. F. B. Lynott, *Secretary.*

THE GEORGIA STATE DENTAL SOCIETY.

The thirty-eighth annual meeting of the Georgia State Dental Society will be held in Savannah, Ga., June 19, 20, 21, 1906. An excellent program of papers and clinics is being prepared and we anticipate a most pleasant as well as profitable meeting. A cordial invitation is extended to all ethical members of the profession.

D. H. McNeill, *Corresponding Secretary,*
Athens, Ga.

OHIO STATE BOARD OF DENTAL EXAMINERS.

The regular semi-annual meeting of the Board of Dental Examiners of the State of Ohio will be held in Columbus, June 26, 27 and 28, 1906.

Only graduates are eligible to examination.

Application, accompanied by fee ($20.00) should be filed with the Secretary by June 16. For further information address

H. C. Brown,
185 East State Street, Columbus, Ohio.

NEW JERSEY STATE BOARD OF REGISTRATION AND EXAMINATION IN DENTISTRY.

The New Jersey State Board of Registration and Examination in Dentistry will hold their semi-annual examination in Trenton, N. J., on the 9th,

10th, 11th, 12th, 13th of July. Practical and theoretical work all completed at that time. Sessions begin promptly at 9 a. m. each day. All applications must be in the hands of the Secretary by July 1. For information kindly address the Secretary, CHARLES A. MEEKER, D. D. S.,
29 Fulton Street, Newark, N. J.

ALUMNI ASSOCIATION OF THE ST. LOUIS DENTAL COLLEGE.

The Annual Clinic and Class Reunion of the Alumni Association of the St. Louis Dental College will be held in St. Louis May 7 and 8 of this year. The various committees have been working energetically, each in its different line, and report that this will be the largest clinic given by the Association. The Committee on Essays have a number of valuable and original papers. The Committee on Clinics have already secured eighty-five interesting clinics and expect to have one hundred the day of the Clinic.

OSCAR HAMMER, *President.*
R. O. BUTTS, *Secretary.*

GRAND RALLY AND SOCIAL REUNION OF THE GRADUATES OF THE PHILADELPHIA DENTAL COLLEGE.

Alumni Day falls upon Thursday, May 31, and will be celebrated in a highly interesting manner by clinics and business meeting in the college at Eighteenth and Buttonwood streets, and a banquet or reception in the evening. Dr. Wheeler of New York will read the Annual Paper. Twenty-five hundred copies of the Alumni Journal will be mailed to the graduates of the Philadelphia Dental College.

A. IRWIN, D. D. S., *Secretary,*
425 Cooper Street, Camden, N. J.

KENTUCKY STATE DENTAL ASSOCIATION.

The time and place for the next annual meeting of the Kentucky State Dental Association has been changed to Louisville, Ky., during "Homecoming Week," June 12, 13 and 14. Special railroad rates of one fare for round trip can be secured.

All former residents of Kentucky in the profession are especially invited and their presence solicited.

A cordial invitation is extended to the profession.

W. M. RANDALL, *Secretary,*
Corner Brook and Broadway, Louisville, Ky.

SOUTHERN DENTAL SOCIETY OF THE STATE OF NEW JERSEY.

The Southern Dental Society of the State of New Jersey will hold all-day clinics May 16 and 17, and listen to illustrated lectures Wednesday evening, May 16. An interesting program comprising either table or chair demonstrations of about twenty clinicians from different cities, on the most practical topics of the day, will be presented. A number of exhibits comprising the latest and best inventions and supplies will be ready for your inspection. The entire fifth floor of the Temple Building, 413-423 Market street, has been provided for the accommodation of visitors, friends, guests, clinicians, exhibiters and dentists. You are cordially invited to attend.

A. IRWIN, *Chairman Executive Committee.*

CENTRAL-VEREIN DEUTSCHER ZAHNARZTE.

The next annual meeting of the Central-Verein Deutscher Zähnarzte will be held at Dresden (Saxony) on the 4th to the 6th of August, immediately following the meeting of the American Dental Society of Europe, in Berlin, and preceding that of the Federation Dentaire Internationale, which takes place at Geneva on the 8th and 9th of August. Members of the profession in America who took part in the meeting of the C.-V. D. Z. at Hanover know that they will be sure of a hearty welcome, and I hereby cordially invite as many of them as intend visiting Europe during the coming summer to arrange their plan so as to meet with us in Dresden at the above mentioned date.

W. D. Miller,
President of the Central-Verein Deutscher Zähnarzte.

THE CLINICAL CONFERENCE OF THE NEW JERSEY STATE DENTAL SOCIETY.

An opportunity is afforded any one having a difficult case in Surgery, Orthodontia, Operative or Prosthetic Dentistry, to present the case for consultation at the coming meeting in July at Asbury Park, N. J. It is hoped that advantage will be taken of this chance to get the opinion and advice of men of exceptional ability in their special lines Correspondence is solicited. The committee desires a concise history of the cases on or before May 30, if possible.

J. G. Halsey, *Chairman*,
Swedesboro, N. J.
W. W. Crate, Camden.
Sarah G. Jackson,
Vineland.
W. H. Gelston, Camden.
A. Percy Roberts,
Elizabeth.
J. A. Waas, Hammonton.
F. K. Heaselton, Trenton.

MEMORIAL RESOLUTIONS ON THE DEATH OF CHARLES C. CHITTENDEN, D. D. S.

Whereas, The Chicago-Odontographic Society has learned of the recent death of Charles C. Chittenden, D. D. S., of Madison, Wis., and

Whereas, He was well known to, and a member of, this body and on terms of intimacy and love with many of its members; and

Whereas, The standards of dental education have been greatly advanced by his pronounced personal activity and literary efforts, and that his purity, his high character as a man in his profession, has endeared him to this society, of which he has been a frequent guest for many years; therefore, be it

Resolved, That we give expression of our love and high regard for him, that we feel deeply his loss, that we are proud of his memory and acknowledge the great value of his life to the profession of dentistry; and be it further

Resolved, That this memorial be presented to the family of the deceased, that a copy be sent to the dental journals, and the same spread upon the records of this society.

(Signed:)
J. G. Reid, D. D. S.
E. J. Perry, D. D. S.
Edmund Noyes, D. D. S.

RECENT PATENTS OF INTEREST TO DENTISTS.

812,976. Dental tools for removing crown pins. George T. Carpenter, Chicago, Ill.

813,348. Grinding stone and disk employed in mechanical and operative dentistry. Harry Sanford-Burton, Oxford, England.

813,178. Slip-joint connection for dental handpieces. Edward E. Smith and H. F. Jones, Philadelphia, Pa.

812,895. Cutter for cutting toothpicks from veneer strips. George P. Stanley, Dixfield, Maine.

814,056. Dental-matrix retainer. Closson M. Leffingwell, Little Falls, Minn.

814,235. Tooth brush. Moses Rosenstein, Medford, Mass.

815,153. Dental tool. Charles P. Fritz, Philadelphia, Pa.

815,040. Instrument for stopping teeth. Percy F. Rutterford, London, England.

815,041. Instrument for stopping teeth. Percy F. Rutterford, London, England.

814,925. Gold catcher for fountain spittoons. Frank E. Webster, Buffalo, N. Y.

Copies of above patents may be obtained for ten cents each by addressing John A. Saul, Solicitor of Patents, Fendall Building, Washington, D. C.

ILLINOIS STATE BOARD OF DENTAL EXAMINERS.

The next regular meeting of the Illinois State Board of Dental Examiners for the examination of applicants for a license to practice dentistry in the State of Illinois will be held in Chicago at the Northwestern University Dental School, southeast corner of Lake and Dearborn streets, beginning Monday, June 4, at 9 a. m.

Applicants must be in possession of the following requirements in order to be eligible to take the examination: First, any person who has been engaged in the actual, legal and lawful practice of dentistry or dental surgery in some other State or country for five consecutive years just prior to application; or, second, is a graduate of and has a diploma from the faculty of a reputable dental college, school, or dental department of a reputable university; or, third, is a graduate of and has a diploma from the faculty of a reputable medical college or medical department of a reputable university, and possesses the necessary qualifications prescribed by the board.

Candidates will be furnished with proper blanks and such other information as is necessary upon application to the secretary. All applications must be filed with the secretary five days prior to the date of examination. The examination fee is twenty dollars ($20.00) with the additional fee of five dollars ($5.00) for a license.

Address all communications to J. G. Reid, *Secretary,*
1204 Trude Building, Chicago, Ill.

FIRST ANNUAL MEETING NATIONAL ASSOCIATION OF DENTAL SALESMEN.

The first annual meeting of the National Association of Dental Salesmen was held co-incident with the big Manufacturers' and Dealers' meeting at the Auditorium, March 26 to 30, 1906. The object of the association is co-operation and exchange of ideas among the salesmen for the good of all concerned, making the competition by fraternalism among the members friendly, even if keen, and ever holding to the eyes of all the ideal of doing business as a clever man of sense, character and honesty would do it, always giving and always expecting a square deal from his competitor.

Paper by Mr. C. A. Sykes, president American Dental Trade Association, on "The Dental Trade, Manufacturer, Salesman, Dentist," was read, and addresses by Mr. Frank Marimon on "Commercial Ambassadors," and Mr. W. C. Holmin on "Salesmanship," were heard and discussed.

The following officers were elected for the ensuing year:

President—C. A. C. Kelley, Buffalo, N. Y.
Vice-President—Oscar Beig, Philadelphia, Pa.
Treasurer—H. J. Bosworth, Chicago, Ill.
Secretary—Judson Stackhouse, Buffalo, N. Y.

The following were elected as vice-presidents to represent the Association in their different sections:

C. N. Bowe, Chicago, Ill.
Wm. Doeloff, Boston, Mass.
H. Q. Altenberg, Des Moines, Iowa.
H. A. Callis, Norfolk, Va.
L. H. Herman, Brooklyn, N. Y.
Dr. O. B. Price, Moncton, N. B., Canada.

JUDGE WILKES ON DENTISTS.

Judge Wilkes, of the Tennessee Supreme Court, is inclined to be very liberal in his construction of the State statute exempting the tools of a mechanic from seizure. In Terry v. McDaniel, 103 Tenn., 415, he held that a barber was a "mechanic," and in a dissenting opinion in the very recent case of Blackmore v. Dismukes he contends that a dentist belongs in the same category. He says:

"I do not concur in all respects with the opinion of the majority. While I agree that the dentist is a professional man, I see no good reason why he may not also be called a mechanic, if he so desires, and other mechanics do not object, so that he may have the benefit of the exemption laws. There is nothing dishonorable in the occupation of a mechanic.

"A dentist has all the tools that were ever used by any carpenter, and he uses them, and uses them all at the same time. He has saws and hammers, and picks ,and pincers, and augurs, and braces, and chisels, and mallets, and if there was any other instrument ever invented or used in the days of the Inquisition he has an approved pattern of it. He has his little buzz saw, that with its music lulls the patient to sleep, while his drill is prospecting for some nerve that up to that time had been quiet and peaceable. Like a carpenter, he builds bridges, and makes excavations, and digs holes and fills them up again.

"I can not conceive how anyone who has ever been under the treatment of a dentist, and survived. can ever afterward doubt that he is both a mechanic and a laboring man. No man can produce the results he does except by hard work.

"It is said that his bills are made out for 'professional services,' and that the amount of them ranks him among professional men, and not merely as a mechanic or laborer. There is great force in this suggestion; but we know that others besides professional men charge high for services. For instance, bank officials, railroad presidents, and presidents of life insurance companies—so that this is not a fair criterion and test.

"While he looks to me like a professional man, and I would not call him otherwise, still I am in favor of saying, at his specal request, that he is a mechanic, so as to give him the benefit of the law. He certainly can not support himself without his tools, nor can he practice his profession. All his science and theory can't either pull or plug a tooth without instruments."—*Law Notes.*

A BRIEF HISTORY OF THE WISCONSIN CASE AND EXTRACTS FROM THE RECENT SUPREME COURT DECISION.

Commencing at the beginning and tracing the history of this case down to July, 1905:

(1) June 8, 1903, the Board in effect held the Dental Department of the Milwaukee Medical College for suspension as to reputability unless the contrary appeared satisfactorily as to the following: Is it guilty? (a) Of having violated the Board's rule 23, prohibiting the acceptance or retention of students at less than the advertised fees. (b) Of having matriculated students without these certificates of the official examiner, as to sufficiency of entrance qualifications?

(2) The college permitted six students, who failed in the entrance qualifications, for the session of 1902 and 1903, to be matriculated, nevertheless, and continue in attendance, making up their deficiency during the year, contrary to the Board's rule on the subject.

(3) The college catalogued the six students for the session of 1903 and 1904 as Juniors, counting the year partly spent in preparatory studies as satisfying the first year of the course, contrary to the Board's command in respect to the matter.

(4) The college elected to submit to the decision of the court, unless ordered to the contrary by the Board, requiring it to give the six students full credit for the year partly spent in the work of preparation, contingent upon whether such action would be regarded by the Board as rendering the college not reputable.

Aside from the foregoing the college was regarded as reputable. The judgment of the Board in that regard having been certified September 15, 1902, it and its graduates were, in all reason, entitled to rely thereon until the occurrence of something inconsistent therewith. Once established, the studies of reputability would be presumed to continue until reasonably rebutted. Time would have no effect thereon, except to weaken the presumption, if even that.

The students who failed had, under the circumstances, some moral claim on the college, which it endeavored to discharge by making them special in the freshman year, and entering them in the academic department as well, and requiring them to spend three hours in study each day in respect to the subjects wherein they were deficient.

The college permitted the students to continue through the junior course, and catalogued them for the session of 1904-1905 as "seniors," thus indicating defiance of the Board's ruling that they should be permitted to graduate, if at all, only in the class of 1906.

So, in brief, the transgression of respondent for which the sentence of non-reputability was pronounced were three in number, namely: (1) Violation of Rule 23, prohibiting concessions to students from advertised fees; (2) violation of the rule prohibiting colleges from accepting students with permission to make up deficiencies in entrance qualifications the first year of their course; (3) violation of the Board's order that the six students should be denied credit for the year partly spent in making up entrance qualifications. Did such transgressions furnish any reasonable basis for the condemnation complained of?

Now, what is there so very wrong about conceding to students some deduction from advertised fees, as seems to have been done by the respondent, that it should be regarded as suggesting non-reputability? No light is shed on that question by counsel for respondent. If there is any reasonable basis for the Board's Rule 23, or its Rule 36, fixing the minimum charge to students at one hundred dollars per term, which seems to be inseparable from the former rule, we are unable to discover it. Reputability has reference to those things which go to the proper preparation of candidates for the dental profession. We venture to say that, all other things being equal, the institution that takes worthy young men, making concessions in their favor to meet their financial needs, thereby assisting them to attain the object of their ambition, is no less worthy of good repute than one which holds to an arbitrary schedule in that regard, tending to exclude much of the very best material for the profession therefrom.

Without any extended discussion it is considered that Rule 23, and other rules upon which it is based, are highly unreasonable.

The system of legislative control under consideration was not designed to enable a licensing board to interfere with the mere business management of dental colleges by making laws regarding their charges for instruction, and their treatment of students in respect to their schedule of fees. The power conferred was limited to reasonable protection of the public against danger of incompetent practitioners securing patronage and is wholly of an administrative character. If the legislature were to go further than to conserve the public welfare, its action in that regard would be destructive, not regulative of rights, and so would be outside of constitutional authority. What interest is it to the public whether a dental college maintains its fees up to a published standard or not, or what particular sum it demands of students as a consideration for the advantages it affords to them? None whatever, as it seems. The Board went entirely outside of its legitimate sphere of action in respect to those matters.

We search the law in vain for anything in its letter or spirit justifying the Board in taking charge of the subject of passing upon entrance qualifications, through its representatives, and making submission to such interference with the business of the college a condition of reputability. There seems to be as little regard for the Board's third ground of action—its prohibition to the making up, to any extent, of entrance qualifications during the first year of a student's course, and making submission to that regulation a condition of reputability. As well might the Board assume authority to regulate any one of many mere administrative features of dental colleges, such as the ordinary examinations during the course, or the particular persons to be employed as instructors, or the test to be applied as to their capability, or the particular persons to apply such test, or the compensation to be paid to members of the instructional force.

By necessary implication the language of the law leaves the college unhampered as regards the examination in respect to that requirement. In the particular case the interference was peculiarly oppressive in that it was not brought to the attention of the college until too late for compliance therewith for the session of 1902-1903 without embarrassment to itself and great injustice to its patrons.

The arbitrary character of the Board's action is further evinced by the fact that the standard of admission at the time it was created was wholly of the Board's invention.

The statutory requirement as to entrance qualifications must be presumed to have been enacted with reference to the common practice of educational institutions as to allowing, in a reasonable degree, deficiencies in entrance qualifications to be made up during the early part of the school course, and contemplated a continuance of that custom. Any other construction of the law would render it such an oppressive and unreasonable interference with the ordinary business of schools as to require its rejection as absurd, if not its condemnation as unconstitutional.

The last ground of the Board's action has been, perhaps, sufficiently condemned without further discussion. It was a very natural climax to the misconception of authority evinced by the adoption of the arbitrary rules before mentioned. Mere assumed authority, if not checked, will ultimately run wild, as it did somewhat in this case, in condemning respondent as not reputable because of its determination to obey the judgment of the circuit court without further contesting the matter, unless seasonably notified that such a course would lead to its being condemned as not reputable.

Reputability has no reference whatever to mere submission to rules of the State official board, or any other board. It has reference, as before indicated, to the actual facilities it possesses for *good work* as regards preparing candidates for the dental profession, and the actual use of such facilities so as to accomplish good work.

The ordinary meaning of "state officer" is head of a state department, such as governor, secretary of state, and the like. It should be thus restricted when used without circumstances indicating any other intent.

In one aspect the error was excess of jurisdiction; in the other it was total want of jurisdiction.

By the Court: The judgment is affirmed.

RELIEF FOR SAN FRANCISCO DENTISTS AND DENTAL DEALERS.

Immediately on receipt of word of the disaster to San Francisco the dentists and dental dealers of Chicago met, and within twenty-four hours had forwarded $1,000 to aid their brethren in the stricken city. As we go to press, April 23, another $1,000 has gone—making $2,000 from Chicago. This will be followed with more as the funds come in. Senator A. C. Clark, 104 Michigan Avenue, is the treasurer of the Chicago committee, and remittances may be sent from this vicinity to him. Dr. E. C. Kirk, editor of the *Dental Cosmos* suggests a national committee of relief, made up of representative dentists in different sections of the country. In the meantime Chicago felt that promptness was paramount and acted accordingly. The stress of the moment makes any words of sympathy sound hollow at this time, and the "DENTAL REVIEW" can only urge action—action prompt and substantial. Let every dentist take the case home to his own heart and show the profession of San Francisco that they are not forgotten in the hour of their trial.

THE

DENTAL REVIEW.

VOL. XX. CHICAGO, JUNE, 1906. No. 6.

PREPARATION OF CAVITIES IN PROXIMAL SURFACES OF INCISORS INVOLVING THE LOSS OF THE INCISAL ANGLE.*

BY ALFRED OWRE, D. M. D., M. D., C. M., MINNEAPOLIS, MINN.

I accepted the invitation of the G. V. Black Dental Club for several reasons; principally because I am a firm believer in society work and organization, as by these means there can be some division of labor, and above all the correlation of isolated studies can also be brought about. Again, the tendency to conflicting opinions can be lessened, and a common aim be more firmly established.

Generally speaking, our dental societies are liable to be influenced by the spirit of the age, i. e., display, grandiose effect, the spectacular, instead of the attention to minuitiæ and detail which is so necessary for our artistic as well as for our scientific growth. There is an unexplored side to everything. In other words, the smallest thing has something unknown in it which we should find. This is why I bring before you a few points seemingly small yet capable of further evolution.

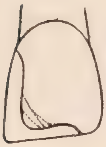
At first I never looked upon these except with the remembrance of what others had already thought of them. Thus working along with former impressions and pictures, some unpleasant experiences were soon encountered, both by myself and by those with whom I worked.

Keen observation in completed operations showed in too many cases the following faults: Tendency to fracture and disintegration of enamel labially and lingually, as illustrated in Figs. Xa and Xb; unsupported enamel in lingual wall of step (Fig. Xc); straining of incisal part of filling, this often extending more or less to gingival; irregular outline form, showing a lack of harmony and grace (Figs. Xd, Xe and Xf; also Xa and Xb).

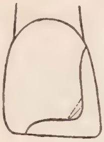
---

* Read at the Midwinter Clinic of the G. V. Black Dental Club, of St. Paul (Inc.).

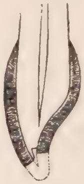
Xa



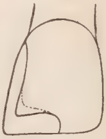
Xb



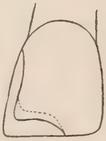
Xc



Xd



Xe



Xf

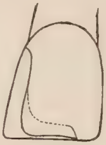


Fig. Xa. Labial view, showing tendency to fracture of enamel as per dotted line. Also showing faulty outline form.

Fig. Xb. Lingual view, showing tendency to fracture of enamel as per dotted line. Also showing faulty outline form.

Fig. Xc. Axio-labio-lingual plane, showing unsupported enamel lingually.

Figs. Xd, Xe, Xf. Irregular outline form, showing a lack of harmony and grace.

It is possible that the texts were not understood, or not interpreted correctly; it is also possible that the field of other co-workers had not been penetrated far enough to yield results. I must also admit that some text writers may have been at fault generally and specifically in both theory and practice. However, the faults enumerated were generally a result of incorrect cavity preparation.

Therefore, in order to obtain more permanent results in these operations, the preparation of the cavity must first of all receive due attention. And in order to attain this first requisite, we must have a perfect knowledge of *the anatomy* of the teeth in question. We must fully appreciate what stress means, and furthermore this correct cavity can not be obtained unless instrumentation is thoroughly understood. Failure in the above three considerations has had a great deal to do with the general failure of the completed operations, besides giving rise to many variations and inaccuracies.

We must have something definite to guide us as far as possible; then less variation will ensue. Anatomy sometimes indicates the kind of preparation wanted, or the fact that anatomy modifies our work of preparation is of the utmost importance. For instance, the very thin, long-crowned tooth calls for a different outline, resistance and retention form. Again, little can be accomplished without a knowledge of enamel structure, its relation to the dentine, extent and location of pulp chambers, and, generally speaking, legitimate variations in form and structure.

As to stress, is it not possible that the act of incising is fully as straining on incisors as the act of mastication is on molars and bicuspids. If this is admitted to be partially so, resistance and retention form must be commensurate, and with the anatomical limitations often encountered, we have a perplexing problem to deal with.

There are other considerations, I know, such as appearance, etc., equally vexing; but for the moment we have enough.

Up to 1898 no perceptible change in the preparation of these cavities was made, although observation was more acute in every detail. After that time, however, and up to 1900, the preparation underwent some modification, which I will try to bring out as clearly as possible, aided by drawings and models.

For purposes of illustration, I have taken the mesio-incisal cavity of a central incisor, using the right angle anchorage as the highest scientific ideal, later referring briefly to earlier and other preparations.

After duly studying the mouth and the forms of the teeth, occlusion, stress, etc., determine the outline form. It is needless, at this late day, to say that extension for prevention, as taught by Dr. G. V. Black, should always be practiced. I don't think it is always advisable to cut the incisal angle away to the mesio-labial groove unless this groove is well defined, or the extent of the carious dentine renders it necessary to cut to it, or even further, as the enamel should be supported by sound dentine.

The incisal edge should then be cut away, in length generally as far as the disto-labial groove, and in depth according to the thickness of the tooth and its wear. This cut should be parallel with the incisal edge, or to an ideal line, which in the completed operation will show an equal thickness of gold throughout. (Fig. 1.)

The only cases where labio-incisal cutting can ever be dis-

pensed with at all is where the wear has exposed the dentine; in
dispensed with at all is where the wear has exposed the dentine; in other words, the incisal edge should always be protected with filling material, and if this can not be done I should rather use another form of cavity preparation not showing the filling material at this point.

I am always thinking of strength and stability in connection with this operation, no matter which outline form is used; therefore, in regard to resistance and retention form, I firmly believe that the maximum amount obtainable is really also the minimum, i. e., within anatomical limitations.

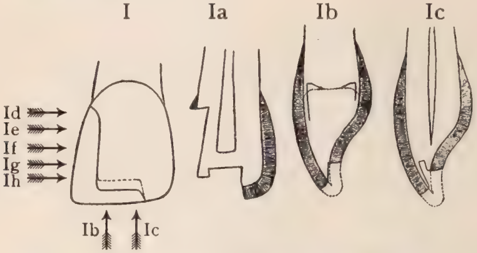


Fig. I. Ideal outline form. The dotted line indicates deviation on lingual surface. Arrows indicate exactly where drawings Ib, Ic, Id, Ie, If, Ig and Ih are made.

Ia. Center of tooth axio-mesio-distal plane.

Ib. Mesial fourth, axio-labio-lingual plane as per arrow in Fig. I.

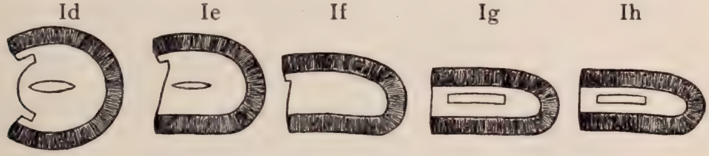
Ic. Center of tooth, axio-labio-lingual plane as per arrow in Fig. I.

When we consider carefully the bulk and surface of filling material exposed to the various straining influences, I am inclined to a little more resistance and retention form rather than to take chances on barely enough. I will try to illustrate these two forms in the cavity by a series of schematic drawings in both planes of the tooth, sections being made as indicated by the arrows in Fig. I.

Fig. Ia shows the center of the tooth in the axio-mesio-distal plane. Note that the gingival wall forms an acute angle with the axial, thus giving us the maximum amount of resistance, and possibly some additional retention. Note also that the groove in the pulpal wall (incisal retention form) does not extend through to the axial wall, but, leaving some dentine (from 1 to 1½ mm.) in order to strengthen these angles; this groove is wider at its base mesio-distally only.

Fig. Ib shows the tooth at the mesial fourth, axio-labio-lingual plane. To give greater strength to the labial enamel plate, practically all the dentine originally there should be left supporting this angle. Often more dentine can be cut away, depending upon the depth of the incisal cut, in order to increase the bulk of filling material at this point. The retention form in the gingival wall is shown in outline only. Fig. Ic is in the center, axio-labio-lingual plane, and shows well the relation of the retention form in the pulpal wall to the labial enamel plate. Please note the equal thickness of dentine supporting this enamel, as well as the *larger* amount supporting the lingual plate.

Figs. Id, e, f, g, h, are all transverse cuts in the horizontal plane. Fig. Id is a cut at the gingival, showing the semi-retention grooves beginning in the point angles, and drawn into the axial wall, forming an angle with the lingual wall in the gingival third, and the same with the labial wall in the gingival and middle third, thus assuring the maximum amount of resistance form in the latter instance.



As per arrows in Fig. I.

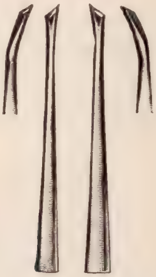
Fig. Ie is in the middle third, near the gingival, showing particularly that the axial and lingual walls are continuous.

Fig. If is in the middle third also, but nearer the incisal, showing the diminution of the resistance form in the labial wall as we approach the step.

Fig. Ig is in the incisal third near the middle third and about at the base of the groove in the pulpal wall, showing well its relation to the labial and lingual enamel plates, most dentine supporting lingual. Please note that now there is no labio-axial line angle, leaving all dentine to support the angle.

Fig. Ih is in the incisal third, on a line with the pulpal wall.

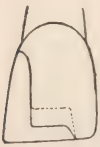
As to the technique, Dr. Black's teaching is largely followed. Some deviations may be worth noting. For the cutting of the incisal edge the flat jeweler's file is not used, only carborundum or emery stones. The removal of the lingual plate of enamel is done with a 4-10 mm. single cut fissure bur sharpened on two sides, starting it from the incisal edge, and cutting usually only the enamel with it. The final shaping of the pulpal wall is done with inverted cone burs and hoes. In the final shaping of the gingival wall and particularly for obtaining the acute gingivo-axial line angle, the hoes 6-(80)-2-6 and 12 (85)-5-6 R. L. are used. The retention form is started with a 4-10 mm. single cut fissure bur sharpened as above. It cuts more accurately than the inverted cone. The latter bur, however, can be used afterwards, and small hoes and hatchets can be used for emphasizing.



Right and left hoes for obtaining the acute gingivo-axial line angle.

The modifications in this preparation as a result of variation in anatomy, wear, etc., are shown in Figs. II, III and IV, with some cross sections where necessary.

II



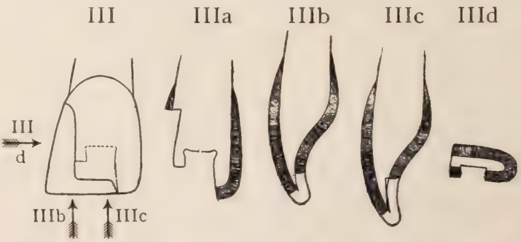


Fig. II. Shows deeper cutting incisally, both labially and lingually.

Fig. III. Outline form adapted to extremely thin teeth, dotted line indicating lingual cut. Arrows indicate where drawings 3b, 3c, 3d are made; 3a axio-mesio-distal plane, near lingual dento-enamel junction.

Fig II is a thinner tooth, hence deeper cutting incisally, both labially and lingually, is often called for; otherwise it is the same as Fig. I.

Fig. III is an extremely thin tooth, with little dentine between the labial and lingual enamel plates, hence a different scheme of retention form is resorted to. Practically only the lingual enamel plate is removed, as per dotted line shown in the same figure, and better in the axio-labio-lingual cuts.

Fig. IIIa is in the axio-mesio-distal plane, near the lingual dento-enamel junction, and shows the resistance and retention form, i. e., base of a triangle toward the gingival.

Fig. IIIb, mesial fourth axio-labio-lingual plane, shows a part of the lingual extension only, and Fig. IIIc, being the center cut, same plane, shows considerable more with some dentine removed.

Fig. IIId, horizontal plane beginning of incisal third, shows well the amount of enamel and dentine removed, as well as resistance and retention at this point.

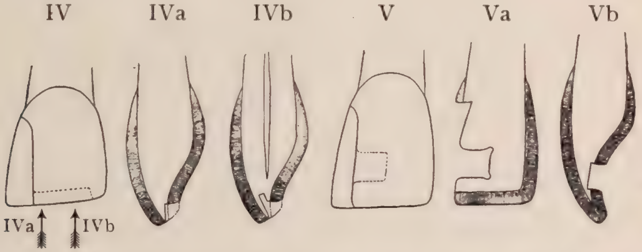


Fig. IV. Abraded tooth, the dotted line shows lingual outline form. Arrows indicate where drawings 4a and 4b are made.

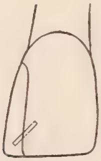
Fig. IV shows a tooth in which the incisal enamel has been worn through to the dentine, and in these cases it might be a question whether or not to protect the labial part of the incisal edge with filling material. The enamel being supported it can be left and will wear evenly as before. The whole of the exposed dentine should be included in the cavity.

Fig. IVa is a cut at the mesial fourth, axio-labio-lingual plane, showing again how the angle should be supported; and Fig. IVb in the center, same plane, shows resistance and retention forms similar to those in Fig. Ic, and otherwise the form is identical.

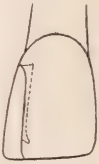
Of the earlier forms little need be said. Perhaps the lingual dovetail, modified somewhat, should be taken up. For instance, Fig. V is a form well adapted to certain cases, especially in long, thin teeth, and it suggests itself for æsthetic reasons. The dotted line is the lingual outline form, and Fig. Va is a cut in the axio-mesio-distal plane near the dento-enamel junction and shows the retention form. Fig. Vb is a cut at the mesial fourth, axio-labio-lingual plane, and shows the amount of enamel and dentine removed, as well as resistance and retention forms.

The preparation offered by Dr. I. C. St. John is not used at present as far as I know. Another form looks feasible, namely, the insertion of a gold wire (anchor posts) in various parts of the cavity, especially used in the incisal, as illustrated in Fig. VI. The wire is threaded and the gold built around it. I think Dr. How originated this method.

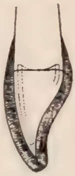
VI



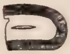
VII



VIIa



VIIb



The old preparation, where the incisal retention form was obtained in the incisal angle, is not scientifically correct, although it has been used many times to advantage, and I suppose it will be for many years to come. Fig. VII shows the form. The dotted line represents schematically the resistance and retention forms.

Fig. VIIa is an improvised drawing showing the retention groove along the axio-labial line angle, and the equal thickness of dentine supporting the labial enamel. Fig. VIIb is a cut in the center of the crown, horizontal plane, showing particularly the axio-labial angle. More illustrations in this plane are not needed, as the axio-labial angle extends the entire length from the axio-labio-gingival point angle to the incisal.

Generally in the preparations shown, please note carefully the specific amount of dentine supporting the enamel where the retention form is placed, i. e., there should never be less than 5-10 mm. of dentine between the retention form and the enamel. Or, in other words, place retention form parallel to the cavo-surface angle, retaining the proper amount of dentine and enamel between. Some such definite rule as the above would lessen the tendency to a promiscuous placing of point angles and retention form almost anywhere in the dentine and even in the enamel.

It is not the aim of this effort to find fault or stir up feeling; but, rather, through this medium, and subsequent criticism to arrive at some understanding of harmonious proportions in the various curves and angles.

The value of collaboration in this respect can not be overestimated, as it gives life and beauty to our work, and may eventually lead to the laws which guide these proportions. Not that these laws will ever enable an inferior dentist to produce the ideals, but that, like the laws of harmony in music, they ought to keep the true and artist dentist within certain lines.

The time allowed me for preparation has been rather short, and I offer this as a partial excuse for the crudeness in presentation of the points involved. If nothing new has been brought to light, it is sincerely hoped that this paper will at least emphasize the necessity for more thought and technical accuracy in connection with the preparation of these cavities.

THE NECESSITY FOR GREATER INTELLIGENCE IN PERFORMING DENTAL OPERATIONS.*

BY C. N. JOHNSON, M. A., L. D. S., D. D. S., CHICAGO, ILL.

The reason your essay committee assigned this subject for me to write on was probably due to the fact that I have so frequently stated in public and in private that the most unfortunate thing connected with the practice of dentistry was the tendency in many of our members to fall into routine methods of doing things without a wise discrimination in each individual case and without a sufficient study of the particular conditions present as a basis for a particular line of action.

---

* Read before the G. V. Black Dental Club, St. Paul, February, 1906.

I have in my inmost heart a very liberal fund of charity for the dentist who makes mistakes. The nature of our calling is such that to practice it to its highest possibilities in all the varied conditions which confront the operator in his every-day work calls for a rare combination of acuteness of observation, concentration of energy, calmness of judgment and infinite discrimination. And if a man fails in some of these requisites at times it is not to be wondered at. But when we consider the issues at stake in our operations, when we realize that it is often the saving of a human tooth which is involved, and that the loss of one tooth may mean the disarrangement of articulation on one entire side of the dental arch, we can not lightly look upon our responsibilities nor shirk the highest performance of our duty on the ground that this duty is difficult.

There are so many ways in which practitioners may increase their usefulness to humanity by the exercise of a higher order of intelligence that they can not all be enumerated here, but in a general way it may be stated that the first essential to the best service is a constant study of the conditions which surround our operations, a fact which has long since become the watchword of this club. Many men simply go on day after day filling cavities in teeth, adjusting crowns and bridges to roots, and inserting artificial dentures with little consideration beyond the cavities, the crowns or the dentures. The forces at work in the given case tending to affect materially the result of the operation are seldom properly studied. I think it was a member of this society who once reported a case where an operator had gone to the extreme in making broad anchorages in a cavity for the retention of a filling against the tipping stress of mastication, cutting extensively for this purpose to the great discomfort of his patient, when upon examination it was found that there was no tooth in the opposite jaw to occlude with the tooth to be filled. Surely greater intelligence was needed in a case of this kind.

I once saw a student place a bur with its end against the floor of the step in a proximo-occlusal cavity in a bicuspid and start to drill straight toward the pulp. I stopped him and asked why he did that. He said: "You told us in one of your lectures to make the axial wall as nearly perpendicular as possible." And yet some men wonder why dental teachers have gray hairs. It is often stated that you can not put intelligence into a brain that has no native capacity for it. To a certain degree this is true, and yet it is often possible to stimulate men to think by the proper kind of appeal who of their own accord never would think, and this is no small achievement.

Today as I look at the mental status of the profession, the chief office of the advance guard it seems to me is to try to develop the thinking habit in the rank and file. There always will be pioneers of thought who go ahead and break the virgin soil, but the bulk of the harvest must be gathered by the masses, and the important thing is to teach the masses how to properly reap. It matters not so much that a few men may know a great deal about dentistry, but it matters seriously that the large majority are capable of rendering efficient service to their patients. And this service can be rendered only by the exercise of intelligence in the planning and performance of operations.

I saw a short time ago a case in which the bicuspids and molars had all been lost on one side of the upper jaw. The cuspid had been crowned and two artificial teeth to take the place of the bicuspids had been attached to this crown without anything to anchor them at the other extremity. Thus one root was carrying three teeth. This was not only bad judgment on general principles, but in this case it was particularly bad, because of the fact that the three incisors next in line with the cuspid carried crowns, all of which were separated. If these four crowns had been joined together there would have been much greater hope of service for the dummies, but as it was the cuspid root had become so loosened by the leverage upon it that its loss in a short time is inevitable. And let me say in passing that in no department of our work is there manifestly a greater need for discrimination and judgment than in crown and bridge work. Clearly in many instances all the laws of physics are ignored as well as the phenomena of mastication and the structure and function of the peridental membranes. It is not in order for me at this time to go into a consideration of the forces of mastication, as they relate to the construction of bridgework, but this should be most carefully studied by every dentist who attempts to do this kind of work.

This question of stress affects us so materially in our every-day operations that at the risk of dealing with an altogether trite subject I must say something about it as it relates to the anchorage of fillings. I am more and more impressed with the very great difference in individuals in the manner in which they use their teeth in mastication. A close study of the landmarks of mastication as left upon the teeth of patients will reveal this in no unmistakable manner, and it is in this line of observation that I make a plea for closer application on the part of practitioners. These landmarks of mastication are very eloquent of what is being done in the way of stress in a given mouth. In some cases they show conclusively that if fillings are to remain in place they must be anchored in the firmest possible manner, and the filling material itself must have sufficient bulk to withstand severe and repeated impact. The wear on fillings is sometimes enormous, and the wonder is not that fillings are occasionally displaced, but that they remain seated at all. The chief factor in these cases is not always the greatest possible stress that can be exerted by the jaws on closure, but the habitual usage given the teeth in mastication. This is manifest by worn places in the occlusal surfaces, by indentations in fillings, and by splintered enamel showing hard service. It is here that great intelligence is needed in repairing the ravages of decay and doing satisfactory work. When a mouth like this is encountered no ordinary methods of operating will suffice. Oxyphosphate of zinc and gutta percha in any position of stress are almost worthless. Even amalgam is soon crushed out of form unless the cavity is made with broad flat seats and the filling material very thick. Gold fillings themselves are not exempt from injury unless the very best mechanical operation is made, and in those positions where it is difficult to secure perfect results in the manipulation of foil it will be found that a properly constructed gold inlay will withstand the stress to better advantage than any other kind of filling. It is in these cases where I have found the very greatest usefulness for gold inlay work, and where I have been able to secure better results than would have been possible in my hands with any other kind of reparative process. Many of these cases are too readily yielded up after a few failures of ordinary fillings, and consigned to crowning, when they might better be preserved by proper methods of filling or by the use of inlays.

And in this connection let me say that inlay workers have in many instances followed the tendency of relying too much on oxyphosphate of zinc and faith to retain their inlays in place. Cavities should be prepared with appreciable depth and with walls nearly parallel so that there shall be some frictional retention to hold the inlays in position irrespective of cement. The intimation that cement has such wonderful adhesive properties as to hold an inlay to a cavity on the same principle that glue will hold two pieces of wood together has given rise to an unwarranted laxity in cavity preparation resulting in the loss of many inlays. We can not escape the mechanics of an operation even in inlay work, and this is particularly true of the cases under consideration where the aggregate stress on our work is very severe.

It seems to me that here is needed a greater intelligence in planning our work and in the technique of carrying it out.

I have in mind some interesting cases of individuals who exhibit a decided tendency toward hard usage of the teeth in mastication. One is a lady who came to me years ago wearing bridges on her upper teeth. The four incisors were in one piece, and there was a bridge on either side from the cuspid back, making three sections on the upper jaw. Although only recently constructed, the bridges were badly forced out of position; the incisors protruded at such an angle as to push the upper lip forward unpleasantly, and the entire case going rapidly to ruin. The difficulty lay in two directions. In addition to the very severe usage which she naturally gave her teeth in mastication the dentist in constructing the bridges had allowed the jaws to drop too close together, thus admitting the lower incisors to very nearly impinge against the gum lingually of the upper incisors and force them forward. A little study on the part of the dentist in planning this work would have shown him the inevitable result of such an arrangement of stress. The remedy consisted in raising the bite on the molars and bicuspids, and readjusting the upper incisors into proper alignment. The reconstructed case has now been worn four or five years and, although the gold is badly battered in places, yet the work is still doing service.

Another case was that of a man who wore a set of artificial teeth on the upper jaw and who had ground the lower natural teeth nearly to the gum line. I never saw such havoc wrought with artificial teeth before, and it was necessary to bridge the lower teeth with a heavy gold bridge to save them from the fate to which his previous dentist had consigned them, viz.: extraction. The patient informed me that he found it necessary to have a new set of upper teeth made every year or so, and this I learned to be a fact. He would literally grind the porcelain and gold together in a way to wear and splinter the porcelain and batter the gold so that the rough edges would have to be smoothed quite frequently. If you examined the occlusal surfaces of his upper teeth at any time you would find the porcelain coated with gold where he had ground it against the lower bridge, and unless the occlusion was very carefully arranged he would invariably split the upper plate along the median line. I looked forward with some apprehension to the time when this excessive pressure would cause absorption and softening of the upper aveolar ridge, but before this occurred to any appreciable extent the patient was attacked by Bright's disease and died.

Another case in which I came to grief with some of my fillings, and in which I should have used more intelligence at the outset by carefully studying the landmarks of mastication, was a gentleman who had, when a young man, lost several teeth and then suddenly awakened to the fact that he wanted to save the rest. I filled some cavities in his molars with amalgam and wherever opposing cusps encountered my fillings the latter were promptly crushed out of shape and out of position. No amalgam that I could use would long withstand the onslaught of those cusps. Not only this, but the enamel itself was made to suffer. Splinters were broken from it and sometimes appreciable slabs. The cavities were large, the man not in good circumstances financially, and I had used amalgam to save his purse. But something had to be done. Gold fillings of the size and in the location of some of the cavities would have been an exceeding tax, and I was not sure that even these would stand the impact for any time. I therefore adopted the plan, which I found to be a good one, of making gold inlays from time to time whenever an amalgam filling failed. These inlays were made with 18-karat solder and let me say, they were made solid. I should have been doubtful of the fate of hollow inlays in such a case. The enamel margins were very freely cut away and the gold extended over them, and this kind of work proved the most satisfactory I could do in these teeth. I have often been curious to know what would have been done in such a mouth by those operators who claim to use porcelain exclusively in all kinds of cases. Of one thing I am certain that porcelain would have been chipped and smashed in a very short time after its insertion.

I have mentioned only a few cases of the many that occur in practice where a high degree of intelligence is required to accomplish the best results, and this intelligence is to be gained only by a constant study of the conditions present as manifested by phenomena in the mouth, which prove an eloquent index to the acute observer.

CLEANLINESS.*

BY DR. J. V. CONZETT, DUBUQUE, IOWA.

Mr. President, Members of the G. V. Black Club, of St. Paul, Ladies and Gentlemen:

Who shall ascend into the hill of success? He that hath clean hands and a pure heart.

We all desire to be successful and it is a laudable ambition; successful not only from a professional, but also from a financial standpoint, and I think that the title and text of this paper furnishes us with the greatest aid to success that we can have, and conversely the greatest foe to success in uncleanliness. In this day of aseptic dentistry, when the very foundation of our professional practice is based on cleanliness, it would seem to be a work of supererogation to speak upon this subject. But when we look into some offices and see the untidiness and dirt, when we behold the person and habits of some men and when we see the manner in which they operate, then we realize that the last word upon the subject is still to be spoken.

This subject naturally divides itself into three parts: First, the man, his character, habits and person. Second, the office, in its furnishings and tidiness. Third, the operations.

---

*Read at the annual midwinter clinic of the G. V. Black Dental Club, of St. Paul (Inc.).

The Man.—It is impossible in a paper of this kind not to say something about the morals of the man, for not only must the hands be clean, but the heart must be pure. I have no desire to preach, and yet I have seen so many young men throw away their opportunities and their lives because they have harbored impure thoughts, until, like hidden fire, they finally burst forth to consume the man and his prospects, that I can not refrain from saying that first of all success rests upon the character of the man. An unclean man may for a time flourish like the green bay tree, but it is only for a time, and in the long run the man of clean character is the man that succeeds.

Personal habit counts for very much. We are in the large majority of instances catering to the tastes of refined and gentle women and there is nothing that more quickly drives away a lady than an unclean and unkept person. In a word the man must be a gentleman in all that the word implies.

Second, the Office.—Next to the personality of the dentist, his office is a factor in his success or failure, for a man may be ever so good an operator, yet if his office reeks of dirt and filth, if the carpets and draperies are dusty and dirty, the linen soiled and thrown carelessly about, the spittoon a filthy mass of putrescence, and the whole atmosphere of the office an offense of the nostrils, he will never be a success, and such offices exist, and sad to say men of ability sometimes occupy them. It is not necessary that the office be elaborately furnished, but all the furnishings should be clean and should be kept clean. I do not think that any dentist should be his own janitor, nor do I think that he should trust that part of his practice to a man, for it requires the trained eye of a woman to see the dirt and her deft hand to remove it. I't pays many times over to employ a good janitress to go over the office thoroughly at least once a week and then the office girl can keep it in good condition. In this day of flowing water there is little excuse for that old abomination, the spittoon. The fountain spittoons are cheap enough to be within the reach of all, and all who have flowing water should have one, for there is nothing that requires so much attention as the old spittoon, and even then it is an offense to the eye as well as to the nose. One patient told me that she refused to go to the dentist whom her husband wished her to consult, on account of his filthy habits. "The last time I went there," she said, "I sent my husband in advance to tell him that I would not visit his office unless he cleaned his spittoon." So you see that I speak by the card. A good waste-paper basket is a device that should be in every dentist's operating room, for there is nothing that looks more untidy than to have bits of cotton soaked with saliva and blood, sand-paper disks and strips, pieces of tape and floss silk, soiled napkins, etc., thrown upon the floor. It is just as easy to toss them into the waste-basket and a great deal cleaner. The linen upon the chair should, of course, be fresh and clean and a clean towel should always be placed about the patient to protect the clothing. One of the things that needs the most careful attention is the saliva ejector. It should be boiled every time it is used, and it is a good scheme to have your assistant place it upon the tubing as the patient takes the chair, that he or she may see that it has just been cleansed and sterilized. It is impossible for me to say much about instrument sterilization, as that would require a paper by itself; suffice to say, that, of course, an instrument should never be used without being carefully sterilized. In my office I have, just back of me, a compartment into which every instrument I use is placed as soon as I am through with it and it is not replaced in its position in my cabinet until it has been sharpened and sterilized.

Third, the Operations.—The first thing that we use in making an operation is the mouth mirror for the purpose of making an examination, and too often it is carried from mouth to mouth with no effort to cleanse it, to say nothing of sterilizing. To show how important it is that even so innocent an instrument as the mirror should be carefully cleansed, I will relate an incident which occurred in my practice. Very recently a young man presented himself to me for treatment, saying that he had had a tooth extracted the day before and that the socket was paining him badly. I examined the socket, found evidences of inflammation and made a palliative treatment; thereafter he called my attention to an inflammation of the gums about the lower third molar. I placed my glass under the tongue for an instant to moisten it and discovered a syphilitic ulcer upon the gingivæ under the tongue. I immediately withdrew my glass and taxed him with being a syphilitic. He admitted it and I proceeded with my treatment. But if I had not recognized the condition and if I had not been in the habit of sterilizing my mirror, the beautiful girl that took my chair immediately after he departed would have been in grave danger of infection. Unfortunately we do not always recognize these cases and worse still the victims seldom or never tell of their condition, so the only safe plain is always sterilize.

One of the things that I find a great many men neglect is the proper cleansing of the patient's teeth. They do not make such operations because it takes too much time and does not pay. Too many men are in the habit of throwing in the cleaning and the consequence is that it is either not done at all or is done in such a cursory manner that it might just as well be left undone. The first thing that we should do when a patient presents for treatment is to make an engagement for a thorough cleaning of the teeth, if necessary, and charge for it. In those cases I usually make half-hour engagements and charge for the time. If the case is such that three or four treatments are necessary to place the mouth in a hygienic condition. I charge accordingly and I find that the patients appreciate the result and gladly pay for it. Of course, I sometimes hear "Oh my! Dr. Blank only charges $1.00 for cleaning teeth," and I answer, "Yes, but if you want your teeth cleaned as I clean them, you will have to pay for the time that it requires."

I am a thorough believer in the rubber dam. I confess that I use it on almost all occasions. You can not see as well what you are doing without it; you can not exclude the saliva and the contained organisms, and the debris of decay and cut-tooth substance, as well as medicaments and filling material fall into the mouth to the annoyance and disgust of the patient. In the treatment of teeth it should always be used. I can not see how a man expects any good results without it. We appreciate the fact that a root canal must not be contaminated by bacteria, if we hope to escape an alveolar abscess, and yet the canals are opened, the saliva allowed to flood them, and we expect that after the treatment with some antiseptic that conditions will be all right. I believe thoroughly in antisepsis in its place, but I believe that the best antisepsis is asepsis.

It is a very difficult matter to write a paper upon this subject and not make it too long. So many phases of it present themselves to me, but I must put them aside. Just one word, however, upon the condition of the operating room after a patient leaves it. I believe that the last patient of the day has just as much right to a clean room, linen, instruments, etc., as the first patient and a patient should not step into your operating room until all evidences of the previous operation have been removed. You say, "I can't do that, I am too busy a man," and I reply that I do not believe that there is a busier man any where than I am; and yet my operating room is so arranged that as soon as an instrument or anything else has been used it is put away, either in the compartment reserved for instruments that must be cleaned and sterilized, or in its proper place, as the filling materials and accessories. There are no strips, disks or dirt on the floor, as they have been thrown into the waste-basket as they have been used, so that all that is required to make the operating room as clean for the last patient as for the first is fresh linen.

I appreciate the fact that this paper will not be of special interest to the members of the Black Club, for no one knows better than I how absolute cleanliness has been dinged into our ears and minds and hearts repeatedly and insistently by our great demonstrator of operative dentistry, Dr. Wedelstaedt, but I know of no society in this land whose influence counts for so much and it is because I want the impetus that their endorsement will give the cause of greater cleanliness in the man, the office and the operations, that I present this paper before you.

WHAT DOES THE DENTAL PROFESSION MOST NEED?*

BY TRUMAN W. BROPHY, M. D., D. D. S., LL. D., CHICAGO, ILL.

Mr. President and Gentlemen:

The title of my paper was given me by Dr. Wedelstaedt, who commanded me to come here and read it on this date, and I obeyed. When I began to study the title and attempt to decide what the dental profession most needs, I found so many conditions which, in my opinion, should be improved, that I resolved to bring to your attention what I believe to be many needs. At the January meeting of the Odontological Society of Chicago, I put the question to each member without giving him an opportunity to think it over, and at length information was given me, which I am making use of, in part, in this communication. Many of the needs of other professions and occupations apply as well to the profession of dentistry. The weakness of men may be criticized in the various vocations of life, yet weak men, mentally and morally, may be found in every calling. We can not, therefore, expect, by the use of the most convincing arguments and the most earnest efforts to remove in all cases the weaknesses of our fellow-beings, nor can we always elevate them to the plane which we desire them to reach.

We have men in our profession who compare favorably as scholars, mentally and scientifically and in the practice of our art, with the higher class of men in other professions, and yet I may truly say that one of the needs of the dental profession is the use and application of a broader general knowledge. The dentist's daily routine of work, which is such a draft upon his vital forces, rather tends to retard him from acquainting himself with the choicest literature of the day. Therefore, we need a greater number of men who will devote their time not only to familiarizing themselves with the current dental literature, but who will acquaint themselves also with the best standard works and writings of our leading authors. There is need in the dental profession of a higher appreciation of professionalism. It is indeed a sad comment on a class of men, who in many instances, appear to not have the slightest conception of what constitutes the difference between professional business and commercial business. The business man sells whatever his customers wish to buy—the want is made known and the article supplied. Too frequently the dentist follows the same practice, and instead of making use of his professional knowledge, and advising his patients as to the best course to pursue, he is often influenced to carry out his patients' wishes. The patient is frequently incompetent to express an opinion as to what the services to him should be. The physician, who is consulted by a patient, gives advice and directs the patient as to what is to be done and his work is usually accepted as law. The dentist should receive his patients in the same manner and advise them as to their needs, and in no instance be influenced to do that which he believes to be wrong to satisfy the whim of the patient, who is not able to judge of his needs. Many years ago, in a conversation with Dr. Allport, he declared that the best service that he rendered to his patients was in advising them as to what to do and every one who knew him would not hesitate to state that he was one of the most accomplished operators of his day.

---

* Read at the midwinter clinic of the G. V. Black Dental Club, of St. Paul (Inc.).

Members of the dental profession need to understand better that patients applying to them for advice receive the benefit of professional knowledge and are benefited thereby. The dentist, however, too frequently while doing his duty to his patient, fails to do his duty to himself. I believe the long period of free services in his consultation room should end and that people who are able to pay for that which they receive should pay the dentist for his advice quite as freely as they would pay the physician for his. The dentist who has so little appreciation of the value of his time and professional advice that he does not exact a fee for it should mend his ways. There is an ethical side of the shortcoming of a dentist who receives and advises his patients without fees. The tendency is to lower the standard of his profession among the people and besides he is not ethical to himself.

One of the greatest needs of the dentist is a more thorough knowledge of pathology and the application of closer observation of the phenomena presented in morbid conditions, also greater skill in manipulation and performing the most difficult and complicated operations. He may, by reason of his failure to recognize the pathological conditions associated with the tooth upon which he is operating, fail to accomplish the best results.

Often in my experience as an oral surgeon, patients are brought to me suffering from diseases of the mouth which have existed for a long period of time and which have not been recognized by the medical or dental attendant. Therefore, the study of pathology and especially dental pathology is essential. Many instances may be cited as an illustration of the foregoing statement to show that members of the dental profession need a more thorough knowledge of pathology.

It is hard to impress upon the minds of students the value of the knowledge of chemistry. The dentist requires a more thorough understanding and knowledge of chemistry than the physician. He deals with nearly all the metals in his capacity as a dentist. Therefore, he should not only know their chemical, but also their physical properties. Chemistry, when thus considered and understood, is not a theoretical study; it is a practical one. The conditions which are active in bringing about the destruction of the dental organs will be understood only by thus acquainting one's self with the chemio-bacteriological changes. The dentist, therefore, needs a better knowledge of chemistry and its application to practice.

The dental profession needs a better knowledge and a closer application to details. Everything bearing on the dentist's work requires an application of exact knowledge. One part of his work which is defective may undo the usefulness of it all.

The teeth, more than any other organ of the body, are subject to disease. Nature often produces new tissue to restore other parts, which is quite the contrary in regard to the teeth. The teeth can not be brought back to usefulness except by the skill of a dentist. A medium good filling is a failure. There are only two kinds of fillings—good and bad—consequently too much stress can not be laid upon manual training and the development of digital and manipulative skill. So one of the great needs of the dental profession is the higher development in our institutions of learning of manual training. Much attention has been given the last few years to the subject of dental education. A great deal of time has been devoted by men who are educators and members of the profession who are interested in the subject.

It has, as usual, when this subject is under consideration, brought out arguments from some men who have not a very clear understanding of what constitutes the preliminary education now required and the requirements of our dental schools from the first matrriculation of the student to the day he graduates. High-school graduation is now required for admission into our colleges. This requirement is certainly a decided step in advance, and yet it is not a fixed standard, since high schools have not a fixed standard for admission and graduation. The curriculum of the various schools differs, yet high-school graduation is generally understood to mean that the graduate possesses a good education. I presume it would be quite safe to say that if the question were put to the dental profession generally: What branches of learning does the high school embrace? What studies does a high-school graduate complete? they would be at loss to answer. We are passing through a period at this time which is of much value in a developmental way and the outcome of the agitation in the field of dental education will be most advantageous. The question involving the length of the college course of instruction has interested the colleges and the Boards of Examiners and the profession generally. Another question which, if put to the members of the dental profession, namely, how many hours of study and practical work in the various laboratories and infirmary is each student required to do from his first matriculation to the day he graduates—would not receive a correct answer, because according to the old plan followed in college courses the work extends over a period of three years and in some institutions four, as stated in the announcement.

Formerly I was one of those who made use of this manner of discussing the length of the college course of instruction. It was Dr. Bethel, of Columbus, Ohio, whose remarks at the National Association of Dental College Faculties meeting, first impressed upon me the fact that to speak of a college course extending over a period of so many years, three or four, as the case might be, was not only misleading but was not in accord with the actual conditions existing.

I do not charge that the men thus speaking desired to mislead, but they have followed a custom which has been handed down through the generations. The only way that a course of instruction can be fixed in the mind is to describe it in the actual hours of work each student is required to do to inform himself on the various subjects presented by the college faculty. This is not to be considered lightly, for it is in accord with the methods now in vogue in our largest and best universities. If a course of instruction in a dental college is said to extend over a period of three or four years, when, in fact, it does not embrace but fractions of years, such a statement is surely misleading. It is because I believe we should fix our course in actual time of weeks and days and hours that I bring this matter before you. If the agitation of the so-called four years' course of instruction in our colleges and the subsequent action of the schools and boards has resulted in no other advantage than the establishment of a fixed course of instruction in weeks and days and hours of time, of itself is of inestimable value. An educational basis, so far as the time element is concerned, has been fixed, and the school may build upon this foundation, which is substantial, expand the curriculum in the weeks and the hours of study. The preceptor knows now when his student enters the college how much time it will be necessary for him to devote to his college work.

Prior to the Franco-Prussian war, what is now the great German Nation, was an aggregation of states. Each state was a nation per se, which had its own government and was independent of all the other States. Wars were frequently waged in one State against another, so they had nothing in common, as they now do in a united and happy nation. The various boards of dental examiners of the United States of America are quite as independent of one another as the States of Germany were prior to the Franco-Prussian War. A man may be qualified under the law of one State and comply with all the requirements of its board and yet if he attempts to practice in another State he is classed as a criminal and is likely to be sent to jail, unless he qualifies with the board in the State in which he last enters. This is a most unfortunate condition of affairs. People abroad naturally wonder when this fact is made known to them. If the United States is a nation, as we believe it is, the man who is qualified to practice dentistry in Minnesota, and has shown by his examinations before the Minnesota board that he is eminently fitted to do so, should not be annoyed or embarrassed by the demands of a board in any other State into which he may go to make his home. Moreover, it would seem to me that his letter testimonial from the board which he passed should be recognized by the authorities in any State or on any island beneath the stars and stripes. Until the time arrives when each board shall recognize the work of other boards and accept it as satisfactory, it would be well for Americans who are clamoring for recognition abroad to wait until they are recognized at home.

One of the great needs of the dental profession is a class of men who have been trained to teach, men who possess a broad knowledge and also who have become thoroughly educated in a school of dentistry, and who have studied pedagogics, the science and the art of teaching. The dental institutions need such men, who in addition, are eminently skilled in the departments of the dental college over which they preside. The time will surely come when the class of men engaged in teaching in our dental colleges will rank higher as teachers than they do today. The dental profession also needs a class of men to conduct the affairs of the profession in the capacity of dental examiners, men who have special qualities which fit them for their duties.

It is difficult under the present laws of the various States to secure the appointment of men whose professional, business and moral standing may always be relied upon to qualify them for the position, so long as dishonest men are able to hold political offices and use their influence in the appointment of men of their own class. The people at large and the profession are constantly menaced by the appointment of incompetent and sometimes disreputable dental examiners. The scandal that has arisen in some of our States in connection with dental examining boards and the fact that bogus institutions have been issuing illegitimate diplomas through the years and that certain board members have been in consort with them and issuing licenses to men unqualified to receive them, brings prominently before us the necessity of doing everything within our power to insure the appointment of men of honor and ability to hold the important positions as examiners.

As I have previously stated, at a recent meeting of the Odontological Society of Chicago, I put the question to each of the twelve members present, "What does the dental profession most need?" At a following meeting, Dr. E. J. Perry stated that he had given the matter some consideration and had written upon the subject. It was my intention to quote from Dr. Perry's paper, but to do him justice I find it will be necessary to incorporate what he has written as follows:

"In responding to the question 'what does our profession most need at the present time,' I must reply to it out of the depths of my own needs. It is in my judgment mental industry, mental discipline; corporal bodily or physical industry, unaccompanied by mental effort, if such a thing is entirely possible, develops mental power, mind power and even spiritual peace. Grow strong by mental industry. Laziness of the mind, I believe, is one of our worst sins. We complain of a man who is physically lazy, but, I believe, mental laziness is much more prevalent, and infinitely more harmful. I don't believe any man who is lazy is truly happy. I believe that work is not only a blessing, but an absolute and indispensible necessity to true happiness. On the cover of the Philistine is the truism, 'The love you liberate in your work is the love you keep.' No man who does not love in the major sense is happy. And the underlying fundamental, actuating principle of it all is work, industry, both physical and mental. If a man would be an athlete he must work. He can not satisfy his pleasures or indulge his appetite. He must be sanely and intelligently industrious, always doing the things he ought to do and resisting the things he ought not to do. If a man would be strong mentally he must not only be mentally industrious, but he must feed his mind on the right kind of food. Mental pastry is useless to the mind, he must resist his lazy desire to feed on it, he constantly needs to achieve a victory over himself, putting his mind at hard work, so acquiring a capacity for work, he must be a close student of himself.

"Dentists are mostly good fellows, but I believe they need above all else, *mental industry*. If we could but always do the things we ought to do, think the thoughts we should think, keep our minds fed with good mental food, read useful books, work out in the fresh air of good and useful thoughts, have as we can so easily, the companionship of the world's best minds, how different it would all be. How the world would light up to us, how many of our difficulties would melt away into easiness. *How* we *could* grow if we *would*. Is this not then our greatest need?

"My heart is sad when I look back and see how I have lost by a lack of mental industry. So many precious hours that they would add up into years have I lost, that are like the waters that have passed the mill without any purpose. My mental muscles are flabby, I am all bent over. I don't half fill my lungs with the good pure air. I keep in a little illy ventilated hut, when the great and blessed sunshine all about me is almost as free as God's gift of the atmosphere to men. I have just been too infernally lazy mentally, and God may never forgive me. My brother man gets but a part of what I owe him.

"While I may not be a type of the profession, I do feel that most of us need above all else outside of the things of the heart, mental industry, mental energy."

Members of the dental profession need a better understanding of business methods. The average dentist, like the average physician, is a poor business man. He should receive instructions in business methods, and transact business in a business-like way. He should collect his bills monthly instead of permitting them to run on indefinitely and often lose them because he is not prompt in making collections. It is always easier to collect a bill within a month after service is rendered than it is in six months, besides people move, change locations and may become bankrupt, so that the man who is slow in collecting his bills often meets with a loss as a consequence.

The dentist should understand and make use of the knowledge which comes from the use of the Roentgen-ray. The diagnostic advantages derived from the use of the X-ray are only fully appreciated by those who are familiar with it. The abnormalities of the teeth and of the bones surrounding them are frequently made clear by the use of this agent.

A broader charity might be named as one of the needs of our profession. Oftentimes an injustice is done to a fellow-practitioner in commenting upon the results of his efforts, when it would be impossible for the one thus criticising to know all the conditions and difficulties and obstacles accompanying the performance of the dental operation which has been adversely criticised. Character building or building professional renown has never been accomplished by attempting to pull others down. So, then, let us deal kindly with our brother even though he errs, and let us practice a broader charity.

A STRANGE PHASE AGAINST EXTENSION FOR PREVENTION.*

BY A. M. LEWIS, D. D. S., AUSTIN, MINN.

Before considering the subject of this paper I wish to say a few words in regard to the work of Dr. G. V. Black. We are all aware that after years of research and toil Dr. Black, through the columns of the *Cosmos* in 1891, gave to the world his ideas on extension for prevention. How well he must have worked out the principles, how perfectly he must have worded his thoughts to be able, almost fifteen years later, to make the following statement, "I have reviewed my papers written for the *Dental Cosmos* in 1891. This review leaves the impression on my mind that considering the time at which these papers were written I should not now wish to change the thought contained nor the directions given in regard to the preparation of cavities, though a few points in nomenclature need revision."

What other profession can produce a man who has given the world a set of principles where the thoughts were so perfectly worded, where the ideas were so perfectly formulated that in fifteen years, yes, ten years, even five years, can say, I can find no fault in them.

In Dr. Ottolengui's papers on extension for prevention in the May, 1901, *Items of Interest* he spends most of his time discussing gingival margin extension. After giving Dr. Black's views in Black's own words, he states, "I have now, I believe, fairly stated the position of Dr. Black, and may proceed to discuss the dogma." He admits that "a cavity filled as Black describes with the gingival and other extensions as he directs, the filling absolutely perfect when completed, would be well filled and as reasonably immune from decay as the hand of man could make it." But, he denies the applicability and the practicability of extension at the gingival margin.

---

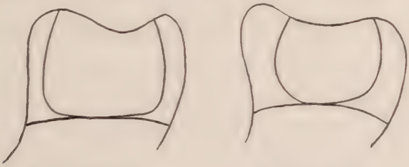
*Read to the members of the G. V. Black Club of St. Paul, at their October, 1905, meeting.

Under the head of "Applicability" he states on page 326, *Items of Interest,* "Patients, therefore, under this mode of treatment, whenever unfortunate enough to present with approximal cavities, must submit to lengthy operations instead of sittings of brief or moderate duration. They must not only endure the pain of the removal of carious tooth bone, but their agonies are to be further prolonged while the delightful engine bur burrows into structure not attacked by disease. Next to the cutting necessary in the preparation of cavities, patients suffer most perhaps in the process of polishing the filling. From a comparatively brief period of pain which would be involved in the polishing of a filling all margins of which might be readily accessible, endurance must continue while the dentist polishes not only a larger area of metal, with comparatively greater ability to transmit the heat of friction, but the treatment of the gingival margin now brings the polishing tools into proximity, yea into contact with the gum. And all this for what reason? Because at some dim and distant period the gum septum may recede so as to afford greater room for the lodgement of food. In which problematical conditions there is a possibility, not a certainty (a possibility, I say) that decay may re-occur around the filling inserted without enlargement of the cavity."

Gentlemen, Dr. Ottolengui's argument on "applicability" is only sarcasm, not proof. We will follow the editor's own tactics. He states on page 733 of the August, 1901, DENTAL REVIEW, "I have been accused of attacking a scientific mode of practice; of casting a doubt upon a valuable, or indeed, the only true method. And I have been told that I have a power for good or evil which is incalculable. I doubt that I have any such extensive influence as has been attributed to me, but granting that it be so, let me say that I am ready to abandon my own views and my own methods; I am ready to adopt this doctrine, yea, to preach it providing you prove it to me. But let me warn you that the loose notions of evidence which has satisfied some will not satisfy me." Dr. Ottolengui, we feel the same; sarcasm will not go; you must prove your statement. Simply because you know of no other method to extend the margins to immune territory than the delightful engine bur, is no proof that we use that method. Simply because you know of no way to polish the gingival margin without coming in contact with the gum tissue, is no proof that we do not. You state on page 733 of The Dental Review, that you traveled all the way from Brooklyn to Chicago to get proof which was not vouchsafed to you in Brooklyn that immunity from recurrence of caries invariably followed the placing of margins beneath the gum. If you paid as much attention to clinical operations at Chicago as you did while at St. Louis in 1904 and at Buffalo in 1905 I am not surprised that you returned without your proof, and I am not surprised that your argument on "Applicability" would be sarcasm and not proof.

On page 326 of *Items of Interest,* the editor states, "Suppose that the situation were fairly and honestly explained to each patient, what proportion of our clients would sanction extension to and beneath the gum margin, in order to avoid the possible immunity from caries under conditions not certain to occur." Gentlemen, this statement is inconsistent. Patients do not come to Dr. Ottolengui or any other practitioner to tell him what he should do. They come *for,* not to give advice. How many of our patients, if we were to ask them in regard to the use of rubber dam, would sanction it? We might make ever so good a plea for its use, if we left the choice to them but few of us would use it.

Under the heading of "Impracticability" the editor states on page 328, *Items of Interest,* "It is, as I see it, unwise teaching because its successful application must rely upon a degree of skill which is above that of the average dentist, and it is the average dentist to whom the majority of patients must turn for attention." Any practitioner who has not sufficient skill to extend a cavity gingivally from one to two millimeters has not sufficient skill to remove the soft decay from any cavity thoroughly, and ought not to be considered in this argument. Bear in mind, I do not say prepare the cavity correctly, I say extend gingivally. To correctly prepare a cavity is a horse of another color, and I will admit that but few have the skill to do this, whether the cavity extends under the gum or not. A little farther he states, "The chief point of difference between this mode and that of the old school is that the operator must have the skill to make the extension, the judgment to know how far to extend, the ability to properly fill against these margins, and to furnish the skill to thoroughly polish them." These are the four differences according to Dr. Ottolengui's idea between this mode and the old school. It is very evident from his own statement that he knows nothing about Black's method of cavity preparation. Let us see what the cavity preparation for the gingival margin of the old school is. Turn with me, if you will, to the American System of Dentistry, page 87. "As the cervical wall is the base of the operation, its preparation needs to be conducted with the full view of the fact that the filling is to be built upon it, and that through a considerable portion of the packing the force used in consolidating the gold, by whatever means used, is extended against it. The plan, therefore, requires that its surface should be cut transverse to the axis of the tooth. The outline should, when the nature of the case will permit, be curved throughout, and should meet the outline of the inner and outer lateral walls of the cavity by an easy rather than an angular curve." (The American System of Dentistry was printed in 1887.) Gentlemen, this is the old school; this is the method of gingival preparation that Dr. Ottolengui has been following for twenty-five years. And this is the method that hundreds of both eastern and western men today are following. And yet he states that the chief mode of difference is the ability to extend, the ability to know how far to extend, and the ability to polish the gingival margin. From the tone of the editor's paper the reader would think that the followers of Black extended the gingival margin from three to four millimeters below the gum line, that they badly mangled the gum in the procedure, and that the margin itself was extended so far toward the apex that it would be difficult to see it.


1, incorrect. 2, correct.
From *The American System of Dentistry.*

I have been practicing Black's method of cavity preparation for eight years, and I find that after the rubber dam is in place and the cavity margins extended to proper lines, all of the margins are in full view of the operator with plenty of room at the gingival margin to perfectly polish the filling without bruising and tearing the gum tissue.

On page 734 of The Dental Review for August, 1901, Dr. Ottolengui states, "In twenty-five years of practice, during all of which time I have consistently extended my cavities root wise only to the limitation of the zone of infection, I have never seen recurrence of decay at the gingival margin of my own gold fillings." This is certainly a wonderful statement, and as one of the gentlemen in the discussion stated, "I take off my hat to you."

After carefully studying Dr. Ottolengui's articles on extension for prevention, I can explain the above statement in only one way. For the last twenty-five years he has been preparing his gingival margins in the oval form according to the cut found in the American System of Dentistry. He admits that decay starts at, or just below the contact point. And in patients' teeth from the age of fifteen to thirty-five, if the gum tissue is normal it will extend almost to the contact point, and it would be impossible for any of us even if we cut only through the zone of infection, to keep that portion of the gingival margin directly root wise from the contact point from being under the gum tissue. And as his gingival margin is only from one to one and one-half millimeters wide and all under the gum, of course it did not decay. Whenever decay took place at the angles, to him it would be the labial and lingual margins, not the gingival. When asked point blank by Dr. Johnson if he ever had decay take place at the bucco-gingival and the linguo-gingival angles the question was never answered.

In the closing discussion the doctor stated, "I promised in the course of my paper that if it should be proved that Dr. Black's method is right I would go home and preach and practice it, and that is what I am going to do." "But a man convinced against his will is of the same opinion still," and in the January *Items of Interest,* 1905, we find an editorial entitled "A Strange Phase of Extension for Prevention."

As this is the doctor's last article on Extension for Prevention, although he wanders wide from his subject, we will discuss it minutely and wander with him. On page 72, 1905, January *Items of Interest,* we find the following statement: "He then proceeded (referring to Dr. Black) to give a presentation of his subject which proved to be one of the very best of his many fine papers. After the paper proper he delivered a most instructive lecture, mainly dealing with initiation of caries in the teeth. He presented in evidence more than 200 lantern slides, the majority of these being superb photographs of human teeth, whole and in sections, showing the inroad of caries. These were followed by wash drawing illustrating the method of cavity preparation, and the true limitation of extension for prevention. These limitations prove to be a welcome surprise to the men of the East, who learn for the first time that the extension should be neither so broad nor so deep as some of Dr. Black's disciples had led them to believe. Many discovered that they had been for years practicing very close to the lines laid down."

It is impossible for this article to have been written without the writer considering himself one of the men from the East, who had learned for the first time that the extension should be neither so broad nor so deep as some of Dr. Black's disciples had led them to believe, and had discovered that he had been for years practicing close to the lines laid down. Either the writer is not a close observer or else he does not know what he is talking about. His previous writings do not show that he has been a close follower of Dr. Black, and the cut on the following page which, as he states, "is a definite cavity formation," is one the like of which Dr. Black never advocated.

Let us, with the writer, wander away from the subject for a moment and discuss packing gold. On page 75 the editor states: "Is not this very gingival margin the only one against which gold may be packed, holding the instrument in the line of the long axis of the tooth? To those who have always used cohesive gold, it is exactly this much discussed gingival margin about which there is the least anxiety, and it is for this very reason. These men believe that at least they can securely pack gold against the gingival seat and gingival margin because it can be packed in the direction of the long axis of the tooth."

Dr. Black states on page 113 of his book entitled "Filling Teeth": "The management of the gingival wall in proximate cavities, especially in the bicuspids and molars, has always been the great stumbling block in filling operations. It is confessedly the most difficult point at which to secure perfect adaptation of gold, or, indeed, any other filling material. In part this difficulty has been from imperfect preparation of this wall, but the real difficulty in securing adaptation lies in the fact that the tendency is to apply the condensing force in a line perpendicular to the plane of that wall. To make perfect adaptation it is necessary that the angle of force be inclined as much as twelve centigrades to the plane of the wall." Are these statements similar? Is Dr. Ottolengui's method close to the lines laid down by Dr. Black?

He absolutely refuses, even to the date of the writing of this editorial, to extend his gingival margin below the free margin of the gum. Is that close to the lines laid down? On page 74, under the heading "Gingival Margin," he states: "On the second evening of this great meeting Dr. Wedelstaedt explains the technique of filling this wide open cavity. We must either cover the gingival seat first with one fold of non-cohesive foil (the Black method) or else we might cover it with three cylinders of non-cohesive foil; the rest of the cavity could well enough be filled with cohesive foil."

Dr. Wedelstaedt stated that cohesive foil would protect the gingival margin, and very fully demonstrated correct and incorrect scientific and unscientific methods. But he pointed out the value of using non-cohesive foil and suggested that it be given more attention. The editor, however, has evidently taken it for granted that the followers of Black believed that all fillings made entirely of cohesive gold, would fail at the gingival margin, and this is his argument against gingival extension. In closing he states: "If, however, cohesive gold will not preserve the gingival margin shaped and placed as directed, then it is a logical deduction that the area which we are told is immune in reality is not immune. In which case extension in this direction is ill advised." The editor reminds me of the Irishman who said he was open to conviction, but there wasn't a d—— man living who could convince him.

DENTAL PROSTHESIS AS APPLIED SCIENCE.*

BY CHARLES R. TURNER, D. D. S., PHILADELPHIA, PA.

Mr. President and Members of the Chicago-Odontographic Society—In inviting your attention this evening to a consideration of the scientific point of view in one phase of dental prosthesis, I realize that I might at once accuse myself of carrying literary coals to Newcastle. I should not resent the charge—in fact, I would say in reply that I have honestly tried to put myself in this position and that if I do succeed in appearing with the coals on my person, I shall have accomplished a desired object. The city in which I now have the honor of being your guest has furnished its great quota of men for the vanguard in the march after scientific truths in dentistry. I know of no society in this country of which it might be said that the scientific researches of its members had contributed more in the last twenty-five years to place the profession of dentistry in that rank among the departments of human endeavor to which its scientific attainments entitle it than the one in whose presence I stand.

Wherever dentistry is at the present time, there is some of the work of men whose names for consideration of your modesty I shall not mention, but which in other places are almost as well known as they are to you.

In viewing the appliances for the restoration of the teeth constructed by our remote forefathers in the profession of dentistry, we are lost in admiration at the skill exhibited in their construction. The specimens of dental work exhumed from Etruscan and Phoenician necropoles, which are the original forebears of modern crown-and-bridge work, demonstrate an interesting and practical knowledge of the use of metals.

The work of Ambroise Pare, of Fauchard, of Magiolo, of those who began almost before dentistry was, inspires us with profound respect and admiration. We sympathize with the difficulties which beset De Chemant, du Chateau, Fonzi, who sought and found materials with which permanent and lasting results might be obtained. We recognize the achievements of the early American pioneers, such as Lemaire, John Greenwood, Gardette, the Peales, and a host of others who contributed to the advancement of dentistry, and we accord their attainments our most respectful praise, and we admire the workmanship of those who have immediately preceded our time in the carving of teeth, in the use of silver and gold. We consider how these men had to hew their way through an untried forest of the unknown, and we judge of their achievements in the light of the attendant circumstances and accord them a just honor. We profit by the experience of those who have by this means brought truths of prosthetic restorations to us, and we use their attainments upon which to erect a larger conception of the possibilities of these restorative measures and we collect and systematize their knowledge and deduce principles for our guidance from it. But when all has been done to accord a just praise to these early workers, if we compare their productions with the work of the foremost prosthetists of the present day, may we not without too great assumption truthfully remark of the former, with rare Ben Jonson, who said of dogs standing on their hind legs, "We do not so mnch admire how well they do it, as to marvel that they do it at all."

---

* Read before the Chicago-Odontographic Society, February, 1906.

A bigger conception of the possibilities of dental restorative measures has arisen from our better understanding of the purposes to which they are to be devoted, of the materials to be used in accomplishing the ends, and the processes for the utilization of the materials. In short, the progress of dental prosthesis has been in the development of a scientific basis for the restorations and its future evolution lies along this road. Science has served to unify and classify the present existing knowledge, the pursuit of knowledge by scientific method has contributed to enlarge its sum total.

That the solid advances which have been made in various fields of dental knowledge in the last several years have been by the use of scientific method will hardly be denied by anyone conversant with the subject. When Black issued his dictum that cavity margins must be laid down upon areas of relative immunity, the dental world realized that a scientific truism had been promulgated that would do more to promote the cause of permanency in operative procedures than any before stated. Since the establishment of definite occlusal relations of the teeth has been accepted as a working basis in orthodontia, that department of dentistry has developed certainty of results which could never have been obtained without that guiding principle. Dental prosthesis has similarly been advanced by scientific methods of investigation, and it is believed that its further progress is largely dependent upon the use of such habits of thought.

In asking your attention to the discussion of the scientific view point in dental prosthesis I am selecting as illustrative of my argument the subject of the restoration of facial expression, a phase of the general question which is frequently denominated its art side, probably by reason of the fact that the standards of fine art are those by which its results are commonly judged and not the standards of mechanics or technics or physiological function, criteria applied to other attributes of the appliances. Before undertaking its consideration, however, it may be wise for us to have as a background a clear view of the relationship existing between art and science, both of which are concerned in the procedures to be discussed. We must also differentiate the generic use of the two words and their use to convey an abstract concept. An art is not to be confounded with the abstract concept art; the former refers to "a system of rules and traditional methods for facilitating the performance of certain actions —to acquaintance with such rules or skill in applying them"—while art in the abstract refers to esthetics or "the science and theory of beauty in perception and expression," or to the esthetic quality itself. "A science," on the other hand, says A. Bain, "is an aggregate of knowledge whose particular items are more closely related to one another in the way of kinship than to any other collective mass of particulars," or put more tersely, "what is known concerning a subject systematically arranged." Whewell thus differentiates the abstract concepts art and science: "The object of science is knowledge, the objects of art are works. In art truth is the means to the end; in science it is only the end." So, "an art involves the means of discipline in the use of the knowledge which may have been furnished by a corresponding science." We see, therefore, that while the aims of science and art are different, they are consecutive—that for the production of a work of art a scientific knowledge of the means which may be employed is fundamental; that the judgment in the use of these means in the production constitutes the art. The more complete the scientific basis of the art, the more complete the art, and the ends of art are promoted by the attainments of science. Thus in dental prosthesis, for example, we have the knowledge utilized in effecting the restoration, the scientific constituent, of the procedure, the art constituent being the judgment in the use of this knowledge and the choice of the end to be attained.

The objects of artificial dentures, it will probably be agreed, are, first, the restoration of the lost parts of the mechanism by which the food is prepared in the mouth for the subsequent stages of its digestion, or the establishment of a satisfactory means for the accomplishment of this function. Second, the restoration of such parts of the mechanism concerned with the formation of voice and the production of articulate speech as have been altered by the loss of the teeth and without imposing an impediment to the proper operation of these functions. Third, the restoration of the facial expression of the individual and any lost parts of the mechanism concerned in the expressive movements of the face. As it is the third of these objects which we are to discuss, I shall not digress to consider the value of a scientific basis for the work in attaining the first two, especially as the necessity for it is so generally recognized. Lack of time also prevents anything more than allusion to the fact of the joint furthering of these several objects by various details relating to the topic under discussion, and incidental reference can only be made to the necessity for satisfactorily reconciling the measures promoting this third object, with the demands imposed by the other two.

In order to undertake the restoration of facial expression it is first necessary to have a clear conception of what it is and how it has been altered by the loss of the teeth.

The term facial expression is to be differentiated from the expressive movements of the face. By the latter reference is made to those co-ordinated contractions of certain groups of facial muscles which occur simultaneously with a given state of feeling, or which express some idea of the mind. Mantegazza says they have two functions—they either supplement or replace language, or they serve to defend the nerve centers or special sense organs from danger. These movements impart characteristic expressions to the face, as that of anger, grief, fear, etc.

The term facial expression, on the other hand, refers more to the fixed expressions of the countenance when it is in repose and none of its muscles are actively contracted. It has largely an anatomical basis. It is determined by the original endowment of the individual upon which a certain stamp or impress of experience has been made. In the development of the fixed expression of the face the original endowment has been influenced by the repeated contraction of the muscles which have accompanied the various thoughts and feelings of the individual. A characteristic expression or cast of the countenance results, and is apparent in the tonicity of the muscles often used, or in the changes in the surface of the skin, such as folds or wrinkles, which have resulted from their repeated action. There may be five verdicts upon the human countenance, says Mantegazza—physiological, ethnological, aesthetic, moral and intellectual. The ethnological and aesthetic are of course purely anatomical—one has to do with the racial characteristics of the face and the other with its value as judged by the standards of art. The physiological, moral and intellectual are based upon expression and are physiological in nature. The first refers to the state of health of the individual, or to the age. The other two have to do with a judgment of the moral and intellectual significance of the expression of the face. We may thus gain some idea of the complexity of the problem with which we have to deal in the restoration of expression if we are to take into account these several considerations.

A more or less characteristic change in the countenance succeeds the loss of the teeth. The teeth as one of the features of the face, visible during movements of the lips, are absent. There is change in the contours of the lips and cheeks because they are no longer supported by the teeth, and the resorption of the alveolar process further contributes to withdraw their support. Changes in the surface of the skin in the form of folds or wrinkles appear, and the relation of the jaws is changed because they are no longer maintained a fixed distance apart by the teeth. Furthermore, there is a limitation to the movements of the lips in the various expressive movements of the face, for they no longer have a support over which they may be moved by the muscles. The dentures are to return to the face the lost teeth, and to restore the relation of the jaws. By the positions of the artificial teeth and the contours of the buccal and labial surfaces of the plates, the lips and cheeks are to be supported in such positions as shall be determined upon as desirable, and the normal activities of the muscles of expression about the mouth are to be provided for.

In undertaking these restorative measures, the prosthetist must first decide upon the exact condition which he wishes them to establish, or in other words must set a goal which he wishes to attain by the procedures. This has to be done upon a judgment based upon the following: First, data obtained from the patient as to the conditions existing before the loss of the teeth; second, knowledge of facial profiles and contours, and dento-facial relations obtained from observation of individuals; third, acquaintance with the ideals of art which relate to the matters in question; fourth, adaptation of this knowledge to the individual case in hand. Let us take up these more in detail.

Bearing constantly in mind the objects effected by the restorative measures, the data to be obtained from the patient are to relate these details to them. It is purposed to have the restoration duplicate the conditions formerly existing in the patient as far as a knowledge of them can be obtained. With this end in view, it is sometimes possible to obtain a photograph of the individual before the changes have occurred which may furnish reliable information in the matter of facial profile and contours, due allowance, of course, being made for the known alterations in these particulars which time effects. It is also in rare instances possible to gain information from other members of the patient's family to whom a strong physical resemblance exists. A son or a daughter, a brother or sister, may in a few cases give valuable data as to some of the details of the restoration, as to the general facial contour, or the forms or arrangement of the teeth, but the reliability of this information must be positively established before it is utilized. In some cases the prosthetist himself may have had personal acquaintance with various details of the conditions existing before the loss of the teeth, the individual may have been a patient; indeed, the natural teeth themselves may have been preserved for reference, and the value of this knowledge will require no argument.

In a majority of instances, however, the data upon which the restoration is based are obtained from the patient at the time it is undertaken. For purposes of description these may be denominated general and local. By the former we allude to the general physical characteristics of the individual which may be included under the term physique. It is by an examination of these that the predominating temperamental type is diagnosed. While the word temperament was originally used to denominate the mental, a belief in the association of definite mental and physical characteristics has been the ground for the use of the term to refer to the latter. Temperament has of necessity a most empirical basis and its use for the designation of associated physical characters persists to the present time for want of a better. Descriptive anthropology and ethnology have not yet furnished a classification which adequately supplies our needs in this direction and until they do we shall have to continue the use of this unscientific relic of the past. The diagnosis of temperament at once gives a large number of data, as to the form, arrangement and color of the teeth.

The relative age of the individual furnishes additional general data. These relate to the color of the teeth, to their probable state of wear, and in part to their arrangement. The great principle of the relation of cause and effect is to be constantly borne in mind, and the causes which operate as age advances should have their results recorded upon the denture.

The local data are obtained from the tissues more immediately related to the site of the restoration. The alveolar arch upon which the dentures are to rest gives some information as to the previous form of the arch of the natural teeth which were supported in it. The relation of the jaws in that position of occlusion which has been decided by considerations later to be presented to establish them, informs one somewhat of the positions which the natural teeth occupied, and this is more especially true of their antero-posterior relationship. The lips, by their distensibility, by the character of their surface, and by their thickness and shape, convey much information as to the positions in which it is desired to establish them, especially when this is considered jointly with the vertical and antero-posterior relation of the jaws.

But, in addition to the data furnished by the patient, something else will be needed for a judgment as to the completion of the operation. One of these requirements will be a knowledge of the human profile, facial contours, and those physical characters of the teeth relating to their appearance which may be acquired in one's experience. While these are partly included under the heading temperament, I refer more especially to details which this is not sufficiently comprehensive to cover. The acquisition of this knowledge requires only intelligent observation. It can not be obtained in a day or a month, but its store may be increased as the years go by from an observation of the people with whom one comes in contact. It is said that if Charles Darwin had never taken his voyage on the Beagle, biological science would not now have its present development, and this is because the trip gave him an opportunity for making the observations, the classification and systematizing of which enabled him to announce those principles which have placed biology upon a scientific basis. Alexander von Humboldt is another whose trained powers of observation are readily recognized in his valuable essays upon political and social science. The faculty requires cultivation, and full appreciation of the great principle of cause and effect to which I have already alluded. "Since all phenomena which have been sufficiently examined have been found to take place with regularity, each having certain fixed conditions, positive and negative, on the occurrence of which it invariably happens, mankind have been able to ascertain * * * the conditions of the occurrence of many phenomena, and the progress of science consists mainly in ascertaining these conditions," says J. S. Mill.

Observations of the profile and facial contours in the light of the conditions determining them are necessary, a clear picture of what they are in those faces in which the antero-posterior relation of the jaws accords with generally accepted ideas of the beautiful is desirable, and the alteration of these in those cases in which the jaw is in a mesial or distal position. The relations of the teeth as they affect the profile in these conditions should be borne in mind and the contours as affected by the arrangement of the teeth. The effects of age are particularly to be noted, first, as they affect the face, and, secondly, as they affect the teeth. As age advances the changes which occur in the body are chiefly atrophic. There is an absorption of the fat from the superficial fascia of the lips, and a reduction of the size of the muscles forming the lips. The surface of the skin alters, the dermis itself undergoing a partial atrophy. This produces wrinkles in addition to those formed at the angle of the eye, on the forehead, at the ala of the nose, and the corner of the mouth, through muscular action. In some individuals the fat accumulates; the muscles have grown smaller. It occupies the cheeks, the chin, but seldom the lips. The fine markings of the lip, as the philtrum, the tuberculum, the sulcus mento-labialis, are lost. These markings must not be confounded with the accentuation of the naso-labial fold and the wrinkles radiating from the mouth, which follow the loss of the teeth.

A consideration of the relationship of cause and effect in connection with the appearance of the teeth as a facial feature is a very prolific field for investigation. The alignment and arrangement of the teeth in the various relations of the jaws is to be noticed. The relation of irregular alignment to the shape of the teeth alone affords pregnant opportunity for observation, and the orthodontist already has this information. The state of wear of the teeth in its age relationship, in its temperamental relationship, and its conditions observed in the light of the overbite, the manner of movement of the jaw, and the positions of the individual teeth, is one of the details which will demand great consideration when artificial dentures are to be constructed.

I have said that acquaintance with the ideals of art is another of the factors underlying a correct judgment in prosthetic restorations. While this is of great importance, its function in the restoration is chiefly to be of service to supplement the factors which have preceded. It is neither possible to accomplish nor desirable to undertake a restoration which will satisfy artistic ideals pertaining to profile and contours, in the cases in which the considerations already given must be neglected. The restorations can only satisfy the demands of art, when they happen at the same time, to satisfy the demands already described as more fundamental. Beside making cases of this character more satisfying, acquaintance with these ideals serves to piece out the restorations where tangible and positive data are missing. It serves a valuable part in determining a choice between two measures, either applicable to the case in hand, but one possessing more beauty in form or expression than the other. I would not also entirely remove that prerogative of art—the idealization of a detail relating to appearance—for I believe this to be permissible when it does not transcend the famous aphorism of rhetoricians that the perfection of art consists in concealing art.

In the fourth place we have said we are to adapt the knowledge we have thus obtained to meet the indications of the individual case. This means that one is to assume the attitude of a rational therapeutist and treat each case upon its individual merits, and that principles rather than details are to be employed for the purpose. The problem in each case is so complex that definiteness or certainty of method must be followed. This does not mean the adoption of a rule of thumb, which is the custom of the empiric; it means the careful ascertainment of the conditions of each case and the meeting of those conditions by established principles.

The method to be pursued must obviously deal first with the most fundamental conditions to be treated, adding to these the other particulars which may be satisfactorily considered later, and the arrangement of these in the order of their most logical sequence.

The determination of the desired relation between the jaws is to be the first measure considered. It is, of course, the operation of taking the bite. As an edentulous case requires a full exhibition of the details in the process, it will be used as illustrative. A bite plate of tentative form is made upon the upper cast, being given the probable shape required by the case, and the same is done for the lower. They are then trimmed to the previously marked plate outline; the upper plate is tried in the mouth, and its buccal and labial surfaces trimmed or added to as indicated to give the desired contour to the lips. Its anterior occlusal surface is then trimmed to a line one-sixteenth of an inch below the lower margin of the upper lip, a position commonly occupied by the occlusal edges of the oral teeth, its posterior portion being curved upward according to the probable plane of occlusion of the teeth. This is one of the first points of reference established, and the length of the upper plate is not subsequently to be altered. The lower bite plate is then tried in separately and its adaptation tested, and then its occlusal surface is trimmed so that it will be in even contact with that of the upper when the jaws are closed. It is purposed to have the bite plates when in contact maintain the jaws in the desired position of occlusion, while at the same time their buccal and labial surfaces shall give the desired support to the lips and cheeks. The proper relation of the jaws must be judged by the external appearance of the face, but as this is affected by the fullness as well as the length of the bite plate, these two dimensions must be considered conjointly. The fullness has already been tentatively determined; the length should be such that when the jaws are closed the lips should rest in easy contact at their edges. The points to receive special attention are the fullness of the plates at the canine region, and the inclination of the labial surfaces to give the desired fullness to the lips. The prospective forward projection of the lips should be judged by their thickness, the age of the individual and by reference to the fixed portions of the profile, projecting lips usually being thick and associated with a receding forehead; thin lips, more nearly straight, accompanying greater development of the frontal region. Adjustment of the fullness of the plates and their length should be made to produce any desired changes in the profile. While the bite plates are not the court of final resort in determining these particulars and are intended to make the gross restorations, attention paid to them at this time saves time when the dentures themselves are placed in the mouth on trial.

The fixed relation of the jaw is then obtained by the approved method, and then the median line of the face, and the line corresponding to the highest point to which the upper lip may be elevated, are recorded upon the bite plates. We have thus obtained a large number of the data to be used in constructing the plates.

The casts are to be mounted upon an articulator capable of individualizing the movements of the mandible of the case in hand and in proper relationship to the joint mechanism of the instrument. The selection of the teeth is the next step to be undertaken.

The combined width of the teeth should be such that when placed in the relation to the alveolar ridge of the cast which it is proposed they shall occupy, the end of the terminal molar shall reach the center of the tuberosity of the upper cast.

The length of the teeth is to be so related to their width as to accord with the temperamental type of the patient. Temperament is also to determine their form and outline. Large cuspids, and in the few cases in which they would be appropriate, larger central incisors are to be used to advantage.

The fundamental color of the teeth is determined in the diagnosis of temperament; the various shades observed in natural teeth as brought out by Royce are to be obtained if possible. These are to be modified to suit the age of the individual, the darkening of the shade being one of the characteristic effects of the accumulation of years. These teeth are then to be mounted for trial upon the articulator. The upper six anterior teeth are so largely concerned with appearance, they are arranged first, particularly since the functional relation of the distal teeth concerned in mastication may be made to accord with these. The upper anterior teeth are set up with the line between the centrals coinciding with the median line, their cutting edges in relation with the edge of the lower bite plate. This fixes their relation with the lips, a relationship so much concerned with the beauty of the acts of laughing and smiling. Their vertical inclination, which is concerned with the support of the lip, is judged from the upper bite plate, which is laid aside for reference. The anterior curve of the arch is determined. The relative position of the teeth is to be made to accord with the temperamental type of the patient and the arrangement observed in teeth of the shape used. Thus in the bilious and nervous temperament and their combinations irregularities are commonly found, and these may be imitated, always bearing in mind the cause and effect relationship, and particularly that imposed by the antero-posterior relation of the jaws.

More than anything else is it necessary to grind the edges of the anterior teeth to imitate the wear of usage. The first two degrees of the anatomist's classification are the ones commonly observed, and the wear imitated should exhibit a resulting relation with the positions of the teeth and manner of movement of the mandible. Recession of the gums may be reproduced for people advanced in years and of the sanguine temperament and its combinations, while individual peculiarities in the way of gold fillings, defects of structure, discoloration and stains which may be clearly traced to the natural teeth should be reproduced when it seems desirable for purposes of preserving the physical identity of the patient.

The distal teeth are then to be articulated in accordance with principles which, of course, can not be discussed in this paper. The buccal and labial contours of the plates are to be established by reference to the bite plate. The plates are then to be tried in the mouth of the patient to judge of the success of the measures already undertaken and to make any alterations or corrections which may become apparent as necessary.

In speaking of the trial of the dentures no further reference to their appearance as a feature of the face will be necessary, as their requirements in this particular have been discussed in such great detail. Suffice it is to say that the alterations to make them accord with these demands should be made at this time.

In discussing the details of the restoration of the facial expression which it is desired the denture shall make, it will be easiest to consider the profile first, then the contours of the face as viewed from the front.

The nose and its base above the lips are fixed, the chin is placed in a definite position with respect to these when the bite fixes the mandible. The points about the lips demanding attention are, first, the inclination of the upper lip. In those cases with what may be termed a normal antero-posterior relation of the jaws, the upper lip is inclined outward from its base, the amount of forward inclination being determined by the thickness of the lip, the harmony between this and the frontal region, and the age of the patient. In the most part it is approximately a straight line, though this may be concaved outward in younger subjects when there is an increased thickness of the lip at its margin, a condition which will assert itself when the labial surface of the denture has a normal curve in the other direction. This line of the upper lip is never in an orthognathous case convex and curved backward. An equal amount of mucous membrane should be displayed when the two lips are in contact. In a case in which the lower jaw is distally placed to the position described in this case, the lip may incline backward, and more of the lower mucous membrane is displayed, while when the lower jaw is protruded, these fine lines are totally destroyed, and the mucous membrane of the lower lip is proportionately more visible.

The sulcus mento-labialis, which imparts considerable beauty to the lower lip when it has a graceful curve, is caused by the greater thickness of the margin of the lip, by the contact of the upper anterior teeth with its upper surface, which serves to roll it slightly outward, and by the intimate attachment of the skin just over the symphysis of the mandible. This is to be established if possible, but where great absorption of the fat has occurred where it did not exist originally, and in very old people, it may not be possible.

Viewing the face from the front the following points are to be noted: The line marking the point of contact of the two lips. This is affected by the natural configuration of the lips, by the distance between the jaws, and by the amount of projection of the structures supporting the lips. Unfortunately, at the age at which plate dentures are necessary, the fine lines characteristic of youth are frequently so altered that the establishment of this line in its most beautiful form is impossible. Of course the original condition may not have been that making this possible. The ideal cupid's bow, observed in the unfinished drawing of Napoleon, is that to be sought in cases in which it is possible. Ordinarily only a straight line of separation may be obtained. This should preferably occupy a horizontal plane. In the natural condition of affairs it does for the most part, although cases are frequently seen in which the distal ends of the line are at a lower level than the middle. This latter condition may frequently be produced if the jaws have been established too close together. Where it existed naturally of course no improvement can be made. The philtrum is frequently obliterated by the falling in of the tissues after the loss of the teeth, if age has not already had this effect. The prosthetist probably has no influence over the formation of this groove other than if the lips are put upon too great a strain it may be further obliterated. The same may be said of a prominent tip or tuberculum of the upper lip. Both age and the loss of the teeth serve to straighten the line of separation between the lips and obliterate this prominence, while in those cases in which this effect has not ensued the tuberculum should be preserved by imposing no great strain upon the lips. The canine eminence will usually require considerable restoration with the artificial dentures because of the large amount of absorption of the process which occurs here. The temperamental type of the individual will assist in affording information in determining the amount of building here to be undertaken. Individuals of the bilious temperament and its various combinations will require prominent cuspids and prominent portions of the plate underlying this tooth. Reference in the individual case should be made to the naso-labial fold, which is usually accentuated both by age and by the loss of the teeth. Ordinarily it extends with decreasing depth to a point slightly below the corner of the mouth. The building out of the canine eminence will increase or decrease this fold by elevating the lips to the level of the cheek tissue adjoining the upper margin of the fold. Reference should also be made in determining the fullness to be established here to the already determined inclination of the center of the lips.

Besides restoring the fixed expression of the face, plate dentures must establish conditions which admit of the normal activity of the expressive movements of the face. A change in the relation of the jaws and the withdrawal of the normal support provided by the teeth and alveolar process for the lips and cheeks, the restoration of the movement of the lips and cheeks in the associated group of muscular movements, which give expressional significance to the face, is caused by these conditions.

While the correct operation of the muscular activities concerned in the expressive movements in which the mouth participates is largely provided for if the dentures answer the other requirements imposed upon them, it is necessary to call attention to those features of the dentures directly concerned in this relationship in order that in the promotion of other purposes these considerations shall not be infringed upon. As with natural dentures, the lips should be capable of free and easy movement over the teeth and the labial surfaces of the artificial dentures. The margins of the plate and its external contours should not encroach upon the line of action of any of the muscles concerned in these movements. The labial contours of the plates and the teeth should support the lips in those positions which have been discussed as proper in the establishment of the fixed expression of the face. They should permit an easy gliding of the lips upon their surfaces as they are moved by the contraction of the various muscles centering in the orbicularis oris.

The upper plate is the one mostly concerned in this relationship. Its upper margin should not impinge upon the attachments of the orbicularis oris in the incisive fossae. At the position of the cuspid tooth there should be enough of a prominence to afford a *point d'appui* for the muscles elevating and contracting the corner of the mouth. The upper margin of the plate should not be so thick as to prevent a direct line of action in the elevation of the lip by the levator labii superioris alaeque nasi and the levator labii superioris proprius.

The lower denture should avoid in its anterior margin the line of action of the levator labii inferioris, which is placed to the side of the median line of the symphysis.

An incorrect relation between the jaws would, of course, cause a limitation of these movements, either if the distance established was too great or too small, and too great or too little prominence to the plates underlying the lips would cause a similar limitation to the expressive movements of the mouth. If artificial dentures were made only to serve the ends which we have discussed this evening, is it not difficult to see how satisfactory results are obtained by those practitioners who, in the parlance of Christian Science, apply "absent treatment," by taking the impression and bites themselves and by having a laboratory man who has never met the patient to do the remainder of the work?

PRESIDENT'S ADDRESS.*

BY S. FINLEY DUNCAN, D. D. S., JOLIET, ILL.

Members of the Illinois State Dental Society:

It is with a feeling of pleasure and congratulation that I greet so many members of this society at the opening session of our forty-second annual meeting. I am glad to see so many of the old "wheel horses" present and am more than pleased to see the younger element so well represented. The past year has been one of unprecedented prosperity to our country in agriculture, in manufactures and commercial lines, and members of our own profession, too, have had their share in the general prosperity. I trust, however, that our prosperity has extended beyond and above merely financial considerations and that we, as a profession, have added much to our store of knowledge and skill, that we have made real and permanent advancement in that which shall be a blessing to humanity, and place our calling on a higher and better plane of existence among the learned professions.

The year, however, has not passed without leaving a shadow in our hearts. We miss from our ranks today the genial face of our vice-president, Dr. Luther W. Skidmore, of Moline. We look back only one short year and remember his activity and anxiety as chairman of the local committee of arrangements, for the success of our annual meeting, then being held in his home town. How he worked and left nothing undone that promised comfort or convenience to the society as a whole or to individual members. But that busy hand is still, and never again shall we see that kindly face in our midst.

---

* Read before the Illinois State Dental Society, Springfield, May 8, 1906.

What more can I say than we mourn his death and believe the world is better for his having lived in it?

Death has also entered the homes of others of our members and taken loved ones from their midst. The slender cord that held them to all things earthly has ben severed, they have crossed the dark river, and, on the farther shore, await the coming only a little later of those left behind. To the bereaved ones, we tender our sincere sympathy and condolence.

Twenty-five years ago it was my good fortune to become a member of the Illinois State Dental Society, and this is the twenty-fifth meeting it has been my privilege to attend. It would be useless for me to attempt to tell you the great benefit I have derived from these meetings and from association with the members of an organization which represents the best talent, the highest standards of excellence and the loftiest ideals. Not only has it furnished inspiration for professional advancement, but in the social features of our meetings the warmest, kindliest and most lasting friendships have been formed.

And just here I wish to congratulate the society on its return to the four days' meeting; thus giving more time for social intercourse and the cultivation of acquaintance with those who have more recently come into membership. Twenty-five years ago it was furthest from my thoughts that I should ever be honored with the highest office within the gift of this society, and I assure you it is with no small degree of pride that I stand here today as the president of the largest and most influential dental organization in this country, if not in the world. For this honor, I most sincerely thank you. It comes just at the time when I have rounded out a quarter century of active service, and am permitted for the first time to wear the badge of a life member. This, too, I also consider a very great honor, for it is one I feel I have earned by actual service.

Twenty-five years has wrought many changes in the personnel of our society. Many who were active in the work at that time, have since fallen by the way. But how much we owe for the good work done by those men in their years of active service in the interests of our profession. Such names as Cushing, Dean, Townsend, Sturgiss, Swain and others who, at that time, were giving the best there was in them to the interest of our society will not be easily forgotten. And to those of us who were fortunate enough to know them intimately and associate with them in society work, their lives will be an inspiration until we, too, shall lay down the work which has been a blessing to us and I trust a help to those associated with us.

To the men who organized this society and tenderly cared for its interests in its early history, all honor and praise. But a very few of them are left to take active part in our annual meetings, but we shall ever cherish the fondest memories for those who have gone before, for surely, "their works do follow them." But while we honor and revere the memory of those who are gone forever from our midst, we would not forget our obligations to many of the older members who are still with us who have been diligent in scientific research for the profound truths and principles that underlie the very foundations of dentistry as a scientific profession. All honor to these men and may they be spared to us for yet many years of service in the interests of our calling and in the interest of humanity at large.

Of those who have come into the society in later years, we are glad to note that many are showing the true professional spirit and are becoming widely known for their original investigations in collateral sciences upon which our successful practice so much depends. This work and spirit on the part of our younger men is to be heartily commended and I trust many more of them may become interested in original research work. For this work it is not every one who has either the talent, opportunity or inclination, but to those who have we should give every encouragement.

In regard to the legal status of the dental profession, in the State of Illinois, I believe we have every reason to be encouraged. With the passage of the Clark Bill by our last General Assembly, which later by the Governor's signature, became a law, the work of prosecuting unlawful practitioners was taken up with renewed vigor and earnestness by our State Board of Dental Examiners, with the result that many of these excresences on professional decency have been put out of business and relegated to "innocuous desuetude."

I can not say words of praise too great for the men who are carrying on this war against those who have no reverence for the law of either God or man, but who lay their plans to entrap and rob the poor unfortunates who fall into their clutches. The members of this great State society should stand back of the board in their every effort and give them every possible assistance in the prosecution of their work. It is impossible for them to do this work unless we, as individuals, give them every possible help in procuring evidence, and in every other way, do all that we can to aid in bringing these law-breakers and impostors on an innocent public to justice.

Our State Board of Dental Examiners has recently adopted an advanced standard or set of rules with which dental schools must comply in order to be recognized by the board as reputable. Would time permit I should like to read to you just here the requirements. But suffice it to say that this advanced standard established by our State Board is bound to have a far-reaching effect in bringing about a uniform standard of dental education. Many schools in our country do not require the preliminary education, the length of course nor give the broad, thorough course of instruction laid down by our State Board. Hence it will be necessary for them to push up their standard, lengthen their course and broaden their curricula, if they expect their graduates to be eligible for examination by the Illinois State Board of Dental Examiners.

But fellow members, how shall we adequately express our appreciation of the great work done by Senator A. C. Clark for placing dentistry upon its present legal basis in our State? Having introduced and successfully carried through both houses of our State Legislature the bill that was vetoed by Governor Yates, thereby failing to become a law, he was not daunted by the failure, but having the courage of his conviction that he was right, he prepared the bill that is now a law, and with splendid courage secured its passage by our last General Assembly. Gentlemen, we owe to this man and those who aided him in any way a debt of gratitude which we can never fully discharge and words fail us when we attempt to express our appreciation of the work he has accomplished for our beloved profession and for humanity at large. Long may he prosper, and live to see the day when not a single one of these unlawful practitioners exists to disgrace our profession and to prey upon an innocent public.

Since the work of our reorganization committee was begun, interest in dental society work has been greatly augmented and greater activity than ever before is the result. It would seem that the profession in Illinois was ready and anxious for such organization on the component society basis, thus giving them membership in tthe State Society as well as the local. The committee of which Dr. A. D. Black is chairman is to be congratulated and complimented on the completeness of its work and the accomplishment of it in so short a time. It has resulted in great interest being aroused in localities where formerly there was no interest and where every man's hand was against that of every other man. And in places where ethics were unknown, good-fellowship now prevails and our men are working hand in hand for the betterment of local conditions and for the advancement of the interests of the profession.

But now that reorganization is an accomplished fact, we must not sit down and consider the work finished. We should do all in our power to keep up the interest in the local societies, for upon this depends the interest and advancement of the State Society. As individuals in our own districts, we should use our best efforts to get every reputable dentist to join the local society and promote good feeling and ethical conduct among its members.

I am informed by Dr. Black that each of the thirty-one societies that was organized last year has elected officers for 1906, and has sent in dues to the State Society and is in a prosperous condition. Since the first of January Dr. Black and his assistants have carried on a hot campaign and we have every assurance that our membership will be much greater than one year ago.

And just here, I want to congratulate Dr. Black on the success of the *Monthly Bulletin.* While this publication has not been a large one, it has served an excellent purpose. Its appearance has been looked forward to by the members of the various societies with a feeling of eagerness and interest. By it each society has been able to know what the others were doing, and thus stimulated and encouraged to do better work. It has probably been of more value in holding our organization together than can be estimated. Its publication has meant no small amount of labor for Dr. Black, and this society is to be congratulated that we have a man who is not only capable but willing to take hold and do such an enormous amount of hard work in the interests of the profession in our State. That the success of the scheme of reorganization adopted by this society is being watched by other State societies, is evidenced by the fact that many of them are seriously considering reorganization under the same general plan.

For the present State meeting I predict a great success. Our program, both in papers and clinics, represents much of the best talent in the State, which is equivalent to saying the best in the world, and I have no doubt that each one will acquit himself with credit and honor to the profession in our great State. I trust that those who have recently become members will feel perfectly free to enter into the discussion of all papers and give us the benefit of their views on subjects under consideration. I also hope that the social features of our meeting will not be neglected. Let everyone make an effort to get acquainted with everyone else, and thus promote sociability and good fellowship.

AN EXTENSIVE CASE OF RESTORATION.

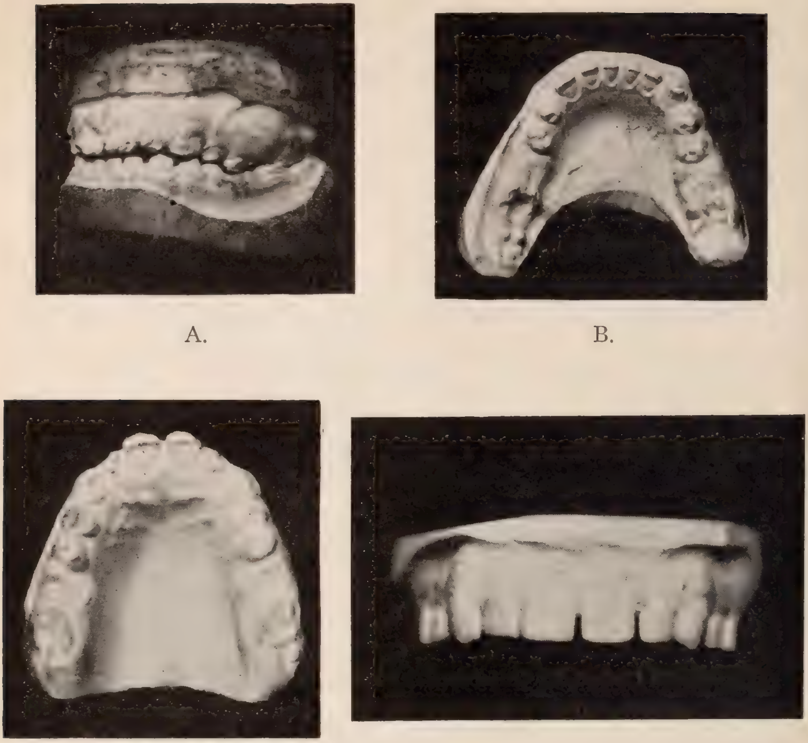
BY J. AUSTIN DUNN, D. D. S., CHICAGO, ILLINOIS.

With reference to the case reported before the Chicago-Odontographic Society, and published in the February number of The Dental Review, page 162, I have had so many requests to write a description of the method of treatment that I hereby submit illustrations of the case and outline the technical procedure.

The age of the patient, 17 years, precluded the advisability of attaching crowns in the ordinary way by removal of the pulps, hence some other method had to be devised, and the fact that there was an entire absence of sensitiveness suggested the tube or cylinder method for the six anterior teeth.

The first thing to do was to raise the bite by means of a solid gold cap $\frac{1}{16}$ of an inch thick, fastened by two platinum posts, as in Fig. 1, covering the two first molars, which had never developed above the gingival line and were flat.

The bicuspids were normal, excepting in shape, tapering somewhat from the gum line toward the cusps. Porcelain facings were anchored on all four, as illustrated in Figs. 2 and 3. Platinum caps were swaged over each tooth, and to make them more secure the cen-



A. B.

C. D.

A, B and C represent the case, before treatment, mentioned by Dr. Black in his paper on "Atrophy" in the February number of THE DENTAL REVIEW, pages 117 and 162. D represents the completed case.

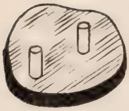


Fig 1

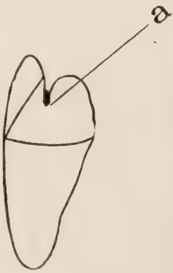


Fig 3

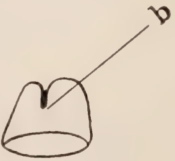


Fig 2

Fig 4

Fig 5

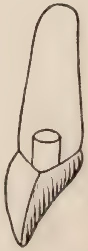


Fig 6

tral fissure (a) was cut out and a piece of 28-gauge platinum fitted and soldered to the main cap (b). They were then finished with porcelain facings in the usual way, and when ready, together with the molar caps, were cemented in place and occluded.

The cuspids and incisors were next prepared, and a trephine of suitable diameter used to make a circular opening in the end of the root, about ⅛ of an inch deep (see Fig. 6), into which was fitted a tube (see Fig. 4) made of 20-karat gold. A platinum cope was then fitted over this and soldered (see Fig. 5), the facing ground to place and the crown finished on all six teeth the same as for a post crown.

It should be remembered that none of the six anterior teeth were banded, and not a single pulp was disturbed, and yet the crowns were firmly anchored, the gum borders in a healthy condition, no metal showing, and the appearance of the mouth is almost a perfect disguise of the artificial.

The lower teeth have not been crowned, but will be treated in the same manner at an early date.

In conclusion I wish to say that this tube method of anchoring will be ideal where a porcelain crown with post has been broken off, for with a trephine on hand a new tooth can be replaced at a great saving of time, and the danger of injury to the root entirely eliminated. Again the same method can be applied to anchoring crowns for elderly people, where the pulps have receded. By the tube method it will not be necessary to destroy the pulp.

PROCEEDINGS OF SOCIETIES.

ANNUAL MIDWINTER CLINIC OF THE G. V. BLACK DENTAL CLUB OF ST. PAUL (INC.)

REPORT OF THE CHAIRMAN OF THE CLINIC COMMITTEE—DR. E. K. WEDELSTAEDT.

The annual clinic is now a thing of the past. It was the largest attended and best dental meeting ever held in the Northwest. Indeed, I question if there has ever been a meeting of this kind held any place in the world. What I refer to in particular, is not the large number who attended, but to the apparent drinking in of every word spoken by the essayists and those who discussed the ideas contained in the papers, the attention given the clinics, the unusual interest manifested by everybody, etc., etc.

When it is taken into consideration that there were between 400 and 500 men present and every man absolutely intent upon what was going on, his whole interest seemingly concentrated on the subject under discussion, a person can not but marvel at such a condition of affairs.

I was asked, "What does it mean?" What does it mean? Let each man who asks this question look over the program and he will see at once that that which was termed "The best program ever prepared," must have something to do with answering the question And if you will pardon me, you gentlemen, our friends from Iowa and the essayists from abroad, did prepare a feast of good things for those who came and you did carry out all that you prepared. The unusually high standard of the essays, as well as the prominence of the men who delivered them, was in itself sufficient to bring to the meeting four or five times as many men, provided that they were interested in progressive dentistry.

The clinics—well—they were so diversified and of such a very high order that almost anybody could be pleased. Operators and table clinicians seemed to vie with each other when it came to going into greatest detail regarding any special thing which was not clearly understood, and they were explaining for the good of the cause which they were representing. The progressive clinic—the first the world has ever seen, was surprising. The great interest displayed in it was worth going a long distance to see. It may be well to have several clinics of this kind at your next annual meeting.

There were a number of things which have been impressed upon my mind and now, three days after the close of the meeting, I wish to place them in writing through fear that something may be forgotten.

The first thing is, the arrangements made for the clinicians—they were perfection. Two hours before the clinic opened every operating chair was in its place. On the bracket beside each chair was a filled alcohol lamp, napkins, towels for the patient, operator and head rest, matches, cotton rolls, a dish with pumice, a drinking glass and in fact everything was ready for the operator and his patient. The room was in charge of Mr. David Perry, manager for Mr. J. T. Ingersoll, who so kindly furnished the operating chairs, brackets, etc., for the clinic. The clinic room was the best arranged that I have ever seen, and personally I am most grateful to Messrs. Ingersoll and Perry. The tables for table clinicians were in place and ready for use. The crowd was the best natured to be found any place.

The earnestness of both operators and those giving table clinics can not be described; it was so great that I have no language with which to convey to another anything which would give him an adequate idea of what it was like. My two associates on the clinic committee, Drs. Carlson and Wilson, certainly did do a mighty work. It seems to me that they were here, there and every where all at the same time. Too much praise can not be given them for their work in the clinic room and the assistance which they rendered me in arranging the program.

I looked over every operation made, but one person can not very well manage a meeting of this kind and also report all the clinics. On this account I must interest you in the ideas of others, who very kindly consented to report some of your operations which I could not.

In looking over the operations that the gentlemen of this club made, I observed several things regarding which it may be well to speak. As a club you operated at St. Louis in 1904 for the consideration of the members of the International Dental Congress. In 1905 you again operated at Buffalo, at the meeting of the National Dental Association. Having watched the operations at both the places just spoken of, and again having watched your operations at the first morning's session, I feel that I am in a position to speak with a certain degree of intelligence regarding the changes which I observe have taken place. The operations made at all three places were as mechanically perfect as the hand of man could make them. Since the St. Louis and Buffalo meetings, however, you have increased your knowledge of the various conditions with which you deal. You all displayed a greater ability to cope with what there was presented for you to operate upon. You seemed to grasp in its entirety every condition regarding the operation. There was no hesitation. You noted at once what the case demanded and you did that very thing. You displayed a greater knowledge of principles of instrumentation than I have ever before seen. You are each to be congratulated upon your ability to demonstrate such skill as was displayed in making the various operations that have been made at this clinic. More than this, so it seems to me, it is not necessary to say.

And now let me speak of the clinics.

Dr. G. D. Moyer, Montevideo, Minn.—Operation, amalgam filling. Cavity, disto-occlusal surface of a lower right first molar.

Dr. A. C. Fawcett, Rochester, Minn.—Operation, amalgam filling. Cavity, mesio-occlusal surface of an upper right first molar.

The cavities were very similar. The lingual and buccal margins were well extended, the gingival seat was made flat, the anchorage was in the occlusal surface. The Black method of using a matrix was employed, also quick setting amalgam. Both operators were highly complimented on the skill displayed in making these very difficult operations. The operations, when completed, could not have been better. The fillings were given a good form, which left the lingual and buccal embrasures of such a nature that the food in its excursions was invited into the interproximal space to the lingual and buccal of the point of contact. I can not commend too highly the operations made by these gentlemen.

THE PROGRESSIVE CLINIC.

Dr. A. C. Searl, Owatonna, Minn. Reported by Dr. J. V. Conzett, Dubuque, Iowa.

Dr. F. S. James, Winona, Minn. Reported by Dr. E. E. Lamberton, Menomonie, Wis.

Dr. J. W. S. Gallagher, Winona, Minn. Reported by Dr. Geo. S. Todd, Lake City, Minn.

The clinic as a whole was reported by Dr. C. N. Johnson, of Chicago.

REPORT BY DR. CONZETT.

Dr. Searl's clinic was a cavity in the disto-occlusal surface of an upper right first bicuspid. The cavity was prepared in the usual way according to the Black-Wedelstaedt method. The lines of the cavity extended buccally, lingually and gingivally into areas of immunity; the gingival and occlusal seats were made flat and the parallel walls at right angles to them. The cavo-surface angle was properly beveled and the finished cavity was a work of art, as was to be expected. After Dr. Searl had finished the cavity preparation, Dr. Gallagher took the case and inserted the gold. He placed two quarter sheet cylinders of non-cohesive gold in the bucco and linguo-gingival axial angles, and one one-half sheet cylinder of foil on the gingival seat between them, keying them to place, and then condensed the gold. The cohesive gold was started with a sixteenth sheet pellet in the disto-buccal angle of the step and then the gold was built up on the axial wall, thus locking the non-cohesive foil to place. Dr. James then took the case to finish it. He cut out the surplus gold in the interproximal space with a Black saw, trimmed the filling to form with Black knife and Wedelstaedt trimmers, and polished with sand paper disks and pumice. The finished filling, although three men had operated on it, was as perfect as it was possible to make it and the three men who operated are not only to be congratulated, but the profession is to be congratulated that the genius of our great master has so definitely systematized our knowledge of operative procedure that it has made it possible for one man to prepare a cavity, another man to fill it, and still another to finish it, without a hitch or error in any part by any of the operators.

REPORT OF DR. E. E. LAMBERTON.

The cavity which Dr. James prepared at the G. V. Black Dental Clinic held in St. Paul at the old Capital building on February 22 and 23, was in the mesio-occlusal surface of an upper right second bicuspid. The cavity was prepared after the usual Black method, practicing extension for prevention, cutting the cavity sufficiently gingivally to extend it well under the gum and extending the buccal and lingual margins sufficiently to pass the point of contact. It was also well extended on the occlusal surface for anchoring the filling. The seat of the cavity was broad, flat and well prepared with sufficient anchorage to withstand the force of mastication and permit of the building of a good gold filling. The cavity preparation seemed to me to be perfect in every detail.

One of the most interesting features of this clinic was to demonstrate the universal method of preparing cavities of this kind by practitioners who are members of the Black Club.

After Dr. James had prepared the cavity Dr. Searl made the filling and Dr. Gallagher polished it. The whole being completed as perfectly as if it had been made by one man.

REPORT BY DR. TODD.

When I was asked to report the clinic of Dr. Gallagher, I was told that I was to stay at the same chair that I began with and consequently I would see each step of the operation, only handled by different operators. The idea of that kind of a clinic was new to me and my curiosity frequently got the better of me and I strayed to the other chairs. Therefore I saw about all that there was to see.

The points that I was careful to observe were the application of the rubber dam, the preparation of the cavity, the placing and condensation of the gold. and the final finishing of the filling.

I will not take up your time in a description of the different points in detail, but touch on general results. What I say will apply to all the operators as well as Dr. Gallagher.

The cavity was in the mesio-occlusal surface of the upper right first molar. Separation had previously been obtained. The dam was applied to cover all the teeth on that side from the central incisor, thus giving the operator all the room possible. The regulation Black step preparation was made and I will say that it was as near ideal, to my understanding of his ideas, as it was possible to make. Dr. James then took the case and placed the gold. He used non-cohesive gold for the gingival third of the cavity and up to about one-third or one-half of the distance to the step, when he changed to cohesive gold. He used a small straight plugger throughout the operation except when he condensed the non-cohesive gold, and a large foot plugger was used in the finishing. No matrix was used.

Dr. Searl then took the case for the finishing. He found the filling so shaped that the interproximal space would permit of the passing of a small saw blade in a Black frame through the space and with the saw he contoured the filling. The saw was never permitted to pass the point of contact. A few strips were used and stones and disks. Several cuttle fish strips were used to polish the point of contact. The point of contact was a point of contact. The whole operation was a feast and I am sure that it is a comfort to the patient.

The main point or conclusion that I arrived at when the operation was all completed was, that the members of the Black Club had received such valuable instruction and were doing such study and work that we could all envy them. It is remarkable I think for one to pick up a piece of work any place and carry it along and then have the same results in all cases. The members of the Black Club are to be congratulated in their efforts to educate us on improved lines and I sincerely thank them for their making this meeting such a grand success.

REPORT BY DR. JOHNSON OF THE PROGRESSIVE CLINIC OF DRS. SEARL, JAMES AND GALLAGHER.

The operations consisted in inserting gold fillings in three cavities, one a cavity in the disto-occlusal surface in an upper bicuspid, the other two cavities were in the mesio-occlusal surface of upper molars. Each operator was assigned a patient. When the cavities were prepared the operators changed patients, each man taking up the work where the other had left off. Another change was made when the gold was condensed, so that the operations were divided into three sections, cavity preparation, insertion and condensation of gold, and finishing the filling. In this way each man operated on all three patients and each patient was operated on by all three men. The result was three beautiful fillings.

The distinctive feature of this clinic was to demonstrate the uniformity of method and the absolute system practiced by the members of the club. There was not the slightest hitch in the entire procedure, and the achievement was a tribute not only to the personal ability of the three men who took part in it but to the principles so long contended for by the leading spirits of the organization.

Dr. J. O. Wells, Minneapolis, Minn.—Operation, Porcelain inlay. It would afford me much pleasure to report this operation, provided such a thing were possible. Somebody requested me to examine the inlay, just prior to its being cemented into the cavity. I went to the chair and spent full five minutes in trying to find it. I did not find it, and to this day know nothing of the operation beyond what Dr. Wilson says. I do know this, however, whatever Dr. Wells did do was as good as could be done, for a more honest man and a more painstaking operator can not be found in the dental profession. And I take greatest pleasure in saying this of a man whom I greatly admire.

Dr. A. M. Lewis, Austin, Minn.—Operation, all porcelain crown. Reported by Dr. E. B. Weeks, Litchfield, Minn.

An all porcelain crown for an upper left lateral incisor. The operator demonstrated the usefulness and beauty of using all porcelain crowns without bands. The root canal had been filled. With a carborundum stone the end of the root was beveled both lingually and labially, the longer head being toward the labial. The latter followed the festoon of the gum very closely but going slightly beneath the free margin of it. The end of the root was ground concave from mesial to distal. A piece of No. 30 platinum was fitted to the end of the root and a square No. 18 iridio-platinum post was now placed in the root canal. The post was soldered to the platinum cap. The post and cap were now fitted to the root and the cap trimmed to exact size of the end of the root. The crown was then finished in the usual way.

(Remarks by Superintendent of Clinics: I had the pleasure of seeing the completed crown. The case was a very difficult one and Dr. Lewis deserves a great deal of credit for making any such operation at a public clinic. The completed crown was in all particulars a most excellent piece of work.)

Dr. W. R. Clack, Clear Lake, Iowa.—Operation, gold filling in the disto-occlusal surface of an upper right first bicuspid. Reported by Dr. J. W. Harris, Morris, Minn.

REPORT BY DR. HARRIS.

Patient presented with right upper first bicuspid largely filled with amalgam on disto-occlusal surface. No history of any trouble from tooth. Filling removed and a large pledget of cotton was found in pulp chamber. Root bifurcated canals patulous, dry and in a fairly aseptic condition. Canals were cleaned, treated with absolute alcohol, dried, treated with oil of eucalyptus, dried with hot air, and filled with gutta-percha point dipped in chloroform. Pulp chamber filled with cement. Cavity prepared with flat gingival seat at right angles to axial line and wall and the buccal and lingual walls parallel and at right angles to seat; occlusal wall at right angles to lines of stress parallel with seat and at right angles to all other walls of the cavity. There were not any pits or grooves made in the cavity.

There being a large facet of wear from the occluding tooth on the buccal cusp and that wall being deemed weak, it was freely cut down so that a heavy plate of gold might take the brunt of the stress. The lower half or two-thirds of the cavity was filled with non-cohesive gold No. 4. Six sheets were introduced by the Black method; four sheets were used cohesively, completing the filling. The painstaking care and skill of the operator left no room for unfavorable criticism in the mind of the reporter.

Dr. G. N. Beemer, Mason City, Iowa.—Operation, gold filling in the mesio-occlusal surface of an upper right first molar. Reported by Dr. J. B. Pherrin, Central City, Iowa.

DR. PHERRIN'S REPORT.

Upper, right first molar; cavity in the occlusal surface small; amalgam filling in mesial surface. Patient practically immune. Previous operator had left a condition inviting the lodgment of food. Decay had extended well beneath mesio-buccal cusp. Because of the slight occlusion upon the tooth at the mesio-occlusal surface, Dr. Beemer decided to extend the gold well upon the cusp, yet not cutting it down. This plan insured ample strength at the same time preserving a desirable esthetic effect.

Two and one-half sheets of non-cohesive gold were placed in gingival portion of cavity, about the same amount of cohesive gold was required to complete the operation. Previous separation slight. A free interproximal space was acquired by malleting, affording good lingual and buccal embrasures, and positive contact point. The operation when completed was a monument to Dr. Beemer's skill, and insured the patient years of comfort (provided he lives).

Dr. F. G. Richardson, Mason City, Iowa.—Operation, seamless gold crown. Reported by Dr. W. H. K. Moyer, Little Falls, Minn.

The case presented for the operation was the root of an upper right first molar. Part of the enamel and dentine on the buccal surface was still in position, but decay had made such inroads upon the rest of the crown as to make the case an impractical one. Decay had extended so that the lingual root was involved. The operator explained that when such cases presented in his practice the tooth was filled with amalgam, thus insuring a good foundation for his crown. Not having come prepared to do this, he demonstrated the method which he uses. (Report of the Superintendent of Clinics: I wish to thank Dr. Richardson for his demonstration. Upon both mornings of the clinic he was at his chair and spent his entire time in interesting others, by making demonstration after demonstration. He did a grand work.)

Dr. T. W. Brophy, Chicago, Ill.—Surgical operations. Reported by Dr. H. J. O'Brien, St. Paul, Minn.

DR. O'BRIEN'S REPORT.

Through the courtesy of Drs. J. B. Brimhall and C. J. Meade, of St. Paul, I was able to supply Dr. Brophy with two cases of cleft palate for operation at St. Joseph's Hospital Thursday, February 22.

Dr. Brophy operated upon these cases in the presence of an audience numbering about seventy-five, composed of physicians and surgeons of this city, dentists both visiting and resident, and nurses of St. Joseph's Hospital. It is unnecessary to state that Dr. Brophy made these operations with the greatest dexterity and was closely followed in his remarks and technic by his audience.

Mother Bernardine took the greatest interest in the clinic, being present herself during the greater part of it, and her house officers extended all the courtesies of the hospital to the eminent operator.

SECOND DAY'S CLINIC, FEBRUARY 23.

Dr. J. V. Conzett, Dubuque, Iowa.—Operation, gold filling in the mesio-occlusal surface of an upper right first molar. Reported by Dr. T. F. Cook, Mediapolis, Iowa.

DR. COOK'S REPORT.

Dr. Conzett's operation was the making of a gold filling in a cavity in the mesio-occlusal surface of an upper left first molar. Cleanliness and dispatch were marked features of the operation. On having the patient close the teeth so as to observe the occlusion, he found there was none; the lower first molar having been extracted. He then proceeded to adjust the rubber dam, first cleansing the teeth and gums to be included with an antiseptic. The dam was adjusted to seven teeth, extending from the upper left central incisor to the upper left second molar, thus admitting of the greatest possible amount of light, and freedom of access to the field of operation. The teeth were then again cleansed with alcohol; this aided in retaining the dam. But one or two ligatures were used in connection with a clamp on the second molar.

An amalgam filling was removed and the cavity prepared in accord with the principles laid down by Dr. G. V. Black and so ably demonstrated throughout the northwest by Dr. E. K. Wedelstaedt. When completed the question was raised as to the strength of the buccal wall and whether the mesio-buccal cusp ought not to be removed and protected by a thick layer of gold? Dr. Conzett, however, felt perfectly secure in the matter, because he knew that there was no occlusion. This, to me, was a good illustration of the necessity for studying the occlusion. Had he not known there was none, his judgment would have compelled him, when he saw that buccal wall, to sacrifice more tooth substance than necessary and needlessly prolong the operation. Moral—Study the occlusion.

He used two sheets of non-cohesive gold in the gingival third of the cavity; three half sheets and two quarters, placing one quarter sheet cylinder in the linguo-gingival portion of the cavity, and another in the bucco-gingival portion. He then placed a half sheet against each of these and finished using non-cohesive foil by wedging another half sheet in the center of the mass, forcing it to place with strong blows from a hand mallet. The cylinders he used were flattened like a wedge. They were placed on the gingival seat with one end abutting against the axial wall and the other projecting beyond the cavity walls at the cavo-surface angle. He then used five or six sheets of cohesive gold in the form of pellets. He finished the filling with strips, disks, and stones, after introducing a Black saw at the gingival and sawing part way to the point of contact. When completed he had a good contact point, a normal inter-proximal space and a beautiful filling, which was in every way characteristic of all of Dr. Conzett's operations.

Dr. C. M. Work, Ottumwa, Iowa.—Operation, porcelain inlay. Reported by Dr. J. O. Wells, Minneapolis, Minn.

DR. WELLS' REPORT.

In reporting this clinic I desire to call attention to the easy manner in which the operator went about his work. If all of us could be as much at home with ourselves and our work our lives would be much easier to live.

The case was by no means a favorable one, the patient being exceedingly careless about the condition of the mouth, and the teeth were badly stained and further disfigured by great cavities in the proximal surfaces.

The operation was in the mesio-incisal surface of an upper right central incisor. The distinctive features in the operation were these: The cavity was prepared entirely with chisels, and the matrix was not reannealed after the burnishing was begun. The other steps in the operation did not differ materially from the ordinary. Brewster's bodies, foundation and enamel, were used in building the inlay. The fusing was begun in a Roach and finished in a Pelton furnace.

The operation when finished was exceedingly good, when we consider what the operator had to contend with.

Dr. J. B. Pherrin, Central City, Iowa.—Operation, gold filling in the mesial surface of an upper left central incisor involving the incisal angle. Reported by Dr. W. A. Demo, Blue Earth City, Minn.

DR. DEMO'S REPORT.

The tooth presented for the operation was an upper left central incisor with a large cavity in the mesial surface but not including the incisal angle. Previously ample space had been gained, the tooth was considerably abraided on the incisal surface so that the two plates of enamel showed distinctly from the dentine. There was also a notch worn on the incisal edge at the point of the distal developmental groove, by the mal-excursion of the teeth during mastication. In removing the decay the incisal angle was rendered so weak that the doctor deemed it best to make a step cavity. In extending the step across the lingual there was a weak part left near the notch which I spoke of so the step was extended to include the notch. Otherwise the extension would not have been so great. The gingival seat of the cavity was made flat and extended well labially and lingually. The incisal edge of the tooth was shortened slightly and beveled that the filling when inserted would protect the labial plate of enamel.

(Report of the Superintendent of Clinics: I do not understand why it is that so many cases are presented to be operated on at these public clinics which are, to use the vulgar parlance of the day, "so fierce." Without careful preparation I would not have attempted several operations which you gentlemen have made. And the operation which Dr. Pherrin made is one of them. In reality that was about "as fierce" a proposition as I should care to come in contact with in my regular practice, without doing it here in the presence of hundreds of other dentists.

Dr. Pherrin made a beautiful operation, just as it was expected he would do. A man who has as good an interpretation of the fundamental principles as he is possessed of and has the skill and ability which he displayed, could not help but make beautiful operations.)

Dr. W. R. Clack, Clear Lake, Iowa.—Operation, gold filling in the disto-occlusal surface of an upper left first bicuspid. Reported by Dr. Alfred Owre, Minneapolis, Minn.

DR. OWRE'S REPORT.

Gold filling, disto-occlusal surface of an upper left bicuspid. Patient, female, age about 40. An exceedingly vexing proposition to start with, e. g., half of the buccal cusp was worn through and fractured so this much at least had to be included in the outline form. The separation between the first molar and second bicuspid had forced the latter into the cavity to be filled. Decay had also progressed rather near to the pulp tissue, increasing sensitivity. Another fact should not be overlooked; the patient had been in the chair for some hours the previous day.

The cavity had to be extended more than usual owing to caries and occlusal wear. It was a typical G. V. Black preparation in every respect. A lining of colodion and Lauderach varnish, half and half, was used, followed by an oxyphosphate of zinc protection over the axial wall of the cavity. One and one-half sheets of non-cohesive foil were used for the gingival third of the cavity, followed by cohesive foil for finishing the operation. An alcohol annealing lamp was employed. Condensation was obtained by the use of suitable pluggers and hand mallet pressure, an assistant wielding the mallet.

No ligatures used for retaining the rubber dam although ten teeth were included to give ample operating room. The instruments used were designed by Drs. Black and Wedelstaedt. All instruments and appliances used were in proper order and perfect condition. The area of the plugger point largely used was about 5/10 mm. As to the technique of insertion and finishing of the filling, that advocated by Dr. Black was carried out to the letter. Two hours' time was consumed for the actual operation, which should be described as a very extensive one, involving one-half of the buccal cusp. The cardinal principles of operative dentistry were illustrated nicely; Extention for prevention, contour and contact, re-establishing the inter-proximal space, condensation of filling, etc., etc. Dr. Clack demonstrated all of the above as well as his mastery of the situation, his answers to all questions were instructive and to the point. The clinic was a genuine treat and will long be remembered as an object lesson in modern scientific and artistic operative dentistry by all those who had the pleasure of observing it.

Dr. S. Bond, Anoka, Minn.—Operation, gold filling in the mesial surface of an upper left lateral incisor. Reported by Dr. A. C. Rosenquist, St. Peter, Minn.

DR. ROSENQUIST'S REPORT.

Dr. Bond made a gold filling in a cavity in the mesial surface of an upper left lateral incisor. The decay did not include the incisal angle, but owing to decay having started in the gingivo-lingual groove the cavity was extended to include that. The salient features of the operation were:

1—Extension along the labial, gingival and lingual margins for prevention.

2—Slightly more extension along the labial margin for convenience.

3—Flat seat.

4—Retention grooves extending from gingivo-lingual and gingivo-labial angles about one-third of the distance toward the incisal end of cavity.

5—Slight pit in incisal angle.

6—Cohesive gold pellets were used to start the filling and until anchorage was safe, when the filling was finished with ribbons of gold of eight thicknesses No. 4 cohesive gold. Finished in usual manner. Result very good.

(Report of the Superintendent of Clinics: It was another of those "fierce" propositions, and Dr. Bond is to be congratulated upon his handling of the case. He certainly covered himself with glory.)

Dr. G. E. Hourn, Lanesboro, Minn.—Operation, Porcelain inlay. Reported by Dr. F. J. Yerke, Owatonna, Minn.

DR. YERKE'S REPORT.

Cavity in the mesial surface of an upper left central incisor. The case was unusually difficult on account of very little previous separation, the operator being obliged to use separator and operate from the lingual surface. The cavity did not involve the incisal angle and was prepared principally by using round and fissure burs. A platinum matrix 1-1000 of an inch in thickness was next burnished into the cavity and by using strips of tape and ball and flat burnishers was accurately adapted to the walls and margins. The matrix was next packed with gum camphor and gently teased out of the cavity and the camphor burned out. The matrix was then partly coated on the inner surface with shellac, to prevent porcelain from adhering and possibly impairing its form in contracting. The matrix was then partially filled with Brewster's yellow foundation body and baked in a Turner gasoline furnace for one minute and forty-five seconds beyond fusing point of gold. By the use of different colors the inlay was beautifully toned and was one of the finest specimens of workmanship it has been my pleasure to report.

The matrix was carefully peeled off and the inlay etched with hydrofluoric acid. It was then cemented to place with Harvard inlay cement and ligated firmly in position with silk ligature. The patient was instructed to leave the ligature in place until next day.

The finished filling was certainly the work of a master hand and bespeaks for the operator a degree of skill rarely attained by members of our profession.

Dr. T. F. Cooke, Mediapolis, Iowa.—Operation, gold filling in the mesio-occlusal surface of an upper right second bicuspid. This was another of those awful cases. The tooth was abnormally situated, being turned disto-mesially full 90 degrees on its axis, thus the lingual surface was where the mesial surface of the tooth should have been. And the portion that occupied the mesial surface was one great mass of decay.

The cavity was prepared along the lines laid down by Black. It was then filled with gold. The completed operation reflected greatest credit on the operator. Under no circumstances would I have made such an operation at a clinic. Every word of praise which I am capable of writing is due Dr. Cooke.

Dr. F. S. Robinson, Chippewa Falls, Wis.—Operation, amalgam filling in the disto-occlusal surface of an upper left second bicuspid. The cavity preparation, use of the matrix, mixing of amalgam, packing the same into the cavity, trimming the filling to form, etc., were along lines which would have pleased anybody who was familiar with the advanced teachings. The amalgam operations made by Drs. Moyer and Fawcett at the first day's session and the one made by Dr. Robinson at the second day's session, were witnessed by a large number of very interested practitioners. I feel that a good work has been accomplished by these operators, in interesting others regarding the best way of making amalgam fillings.

TABLE CLINICS.

Dr. F. S. Robinson, Chippewa Falls, Wis.—Plaster of paris casts containing copies of conditions of failure.

These casts illustrated many abnormal conditions which lead to failure of dental operations. In other casts, which the doctor exhibited were copies of the conditions after he had operated upon the teeth.

Dr. S. Bond, Anoka, Minn.—With a skull containing a full complement of teeth, Dr. Bond demonstrated what use he made of the Wedelstaedt trimmers. He fully explained the use of each instrument in the set and he held a most entertaining and instructive clinic.

Dr. Alfred Owre, Minneapolis, Minn.—The table clinic which the doctor presented for the consideration of those who attended the clinic, was like everything which Dr. Owre does—perfection itself.

An essay of five thousand words would have to be written to convey anything like an idea of its comprehensiveness. As I look back and try to think of everything concerning correct and incorrect cavity preparation, so far as it pertains to cavities in the proximal surfaces of upper incisors which involved the angle, there seems to be nothing which was not displayed.

Dr. F. J. Yerke, Owatonna, Minn.—A demonstration of the use of each instrument in the Black set of cutting instruments upon very large plaster of paris teeth, containing cavities, which could be seen by everybody. Dr. Yerke showed what use he would make of each instrument in the set. The clinic was most instructive.

Dr. H. J. Hansen, La Crosse, Wis.—Demonstrated the use of his improved rubber dam clamp.

Dr. J. L. Kelly, St. Paul, Minn.—Demonstrated the uses of appliances for special cases where removable bridges should be used.

Dr. W. D. James, Tracy, Minn.—On the second day of the clinic Dr. James demonstrated the latest mechanical appliances for partial lower plates. The ability of the demonstrator is so great that it goes without saying any table clinic which he may give is not only most interesting but of greatest value. I did not have a chance to see his display but judging from the number of people which were around his table, it must have been most attractive and of its usual high order.

Dr. O. C. Zieger, Owatonna, Minn.—Demonstrated how each practitioner could build an electric furnace. Dr. Zieger, like Dr. Bond, is one of our very modest members, but the ability displayed by both the men just mentioned, in holding a large number of men throughout their entire demonstrations, was of such a nature that I regretted not having them on the program as table clinicians upon both days of the meeting. The building of an electric furnace was very fully explained and every stage of the work illustrated.

Dr. A. C. Fawcett, Rochester, Minn.—A demonstration of conditions of failure in plaster of paris casts. The doctor did most excellent work. He and Dr. F. S. Robinson interested a large body of men in a subject which I feel is of vital importance. The casts exhibited by both men were beautiful examples of failures most commonly seen and the casts showing the corrected conditions were most interesting.

Dr. S. E. Wallace, La Belle, Mo.—Demonstrated the value of Somnoform by administering it to all who desired to avail themselves of a chance to become acquainted with it. On account of administering this agent so often Dr. Wallace has become very expert in administering it to others.

Dr. C. N. Johnson, Chicago, Ill.—With cavities cut in teeth Dr. Johnson illustrated the differences which should exist in prepared cavities where metal fillings are to be used and where an inlay is to be placed. If surrounded by a large crowd and explaining and answering questions until a person is so hoarse that he can only speak with much difficulty, if these things make successful table clinics, then this clinic was most successful.

Dr. T. W. Brophy, Chicago, Ill.—Demonstrated the value of the electric light in making examinations of the oral cavity, antrum, etc. I have no words with which to express my thoughts in regard to this demonstration. Dr. Brophy examined a large number of patients and he did a herculean work.

If the interest which was displayed by so many men in the practical operations and table clinics, is like straw, indicative of which way the wind blows, then it will be necessary for us to make some radical changes in our meeting place, program, etc. There were twenty or more men who wished to operate, yet we could not accommodate them. The same thing is true regarding the men who wished to give a table clinic. There must have been forty or fifty men in the hall who had in their pockets instruments or casts or something which was of value to others, and they were desirous that the others should see what they had to display, and they wished to tell us all about it. Still there was no place for them. As the Black Club is the only organization that holds these midwinter clinics in this section of the country, it depends upon us to take such action as will be necessary to overcome the present condition of affairs. This action must be taken, provided we wish to awaken a greater interest which should be productive of doing good to a larger number. Instead of but three men making a progressive clinic, let us have a clinic of this kind where ten men may operate, or else have several smaller progressive clinics. Let there be a larger number of table clinics —not too many, but enough to call attention to that which is new.

I ask that you carefully consider these different things and report upon them at our monthly meetings.

Never in the history of the dental profession has there been any such clinic held as the one just closed. This statement has been made so often, and by so many men who attended the meeting, that I am beginning to believe that that which so many believe must be true. Let us begin at once working for the clinic which will be held in February, 1907, and if possible make it equal the one just closed, or make it better. Better it should be, for you have twelve months in which to become further acquainted with the various conditions which confront you each day while at the chair.

I do not know how to thank you for the assistance which you have rendered in carrying on this grand work. You know that I do thank you and that is enough.

And now a word of thanks to the essayists and operators who came from without our membership. Who can speak of that mighty giant Black and do him justice? Not I. The grandeur of his nature, the unfathomable depth of his intellect and its breadth, causes all others to seem only pigmies when a comparison is made. Verily, he is such a deep scientific thinker that the members of the dental profession little realize what the man really is. We were honored by having him with us, to listen to his words, and let him see how every man in one organization was carrying out his ideas regarding the best means to be employed by others in their endeavors to prolong the usefulness of the human teeth. Seldom, in this world, is it the privilege of a human being to live long enough to see his theories entirely accepted and made use of by others as was demonstrated at this meeting. Never in his life did he deliver such a lecture as the one we heard on the night of February 22d; and those glorious pictures. his explanation of each condition, so beautifully illustrated, was the means of doing incalculable good. Let us honor the man while he lives and speak words of praise now, not waiting, as is so often done, until too late and the man gone from us.

What can I say of our beloved friend, Johnson? Of him who year after year comes to deliberate with us? Do we not drag him away from his work when he is "so tired" and most needed there? Let us continue so to do for we all love him and delight to have him with us.

What of the Trueman—our friend Brophy, who says kind things which rejoice our hearts? Who does good to people by making changes in their oral cavities which are the means of causing them to live better, to speak more plainly and enjoy life the more? Does he not also do great good? And is he not doing it each day? What of Dr. Owre. He of the Utopian idea. Could he but have his way, how perfect would be the world, how grand, just like his own nature. And of Conzett? That mighty man of force among his people, a power for good for he himself is so. Of Wells and Crandall, who have never failed us, of Work and Pherrin, have they not been tried by the fire and not found wanting? Of Hourn—a young man who has come to us for the first time—but he proves himself true. What can I say, only, *we all thank you.* May good come to each and all of you.

(NOTE: The writer of this report offers an apology to the reader. It was written most hurriedly, and on account of so many other things, he has not been able to find time in which to revise and rewrite it.)

CHICAGO-ODONTOGRAPHIC SOCIETY.

A regular meeting was held February 20, 1906, with the president, Dr. W. H. Taggart, in the chair.

Dr. Charles R. Turner, of Philadelphia, Pa., the guest of the evening, read a paper entitled, "Prosthetic Dentistry as an Applied Science," which was illustrated with lantern slides.

DISCUSSION.

DR. C. S. CASE:

I first wish to acknowledge the compliment which has been paid to me in the invitation to open the discussion upon a paper in the department of dental prosthesis, particularly because of the high standing of this society, and the distinguished position which the essayist, our guest, has gained in his able and untiring efforts to bring this department to a higher plane of perfection and to its rightful position among the arts and applied science of dentistry.

I am not going to disagree with the principles he has so ably presented, because I find nothing in the main trend of his paper in discord with my own views, though in a strife to accomplish the highest attainments in every department of our work, the employment of methods will differ as men differ in other particulars; nor am I going to attempt the discussion of any other than the art side feature of this work. In doing so I shall endeavor to enforce the teachings of the essayist by some of the principles I advocated and considered of the utmost importance when I was teaching this branch of dentistry years ago. In connection with this, I will endeavor to briefly express a few thoughts relative to the principles of facial art, which I consider applicable to this department that have arisen since my practice has been confined to orthodontia and dento-facial orthopedia.

While one can not always hope to attain to the same artistic results with the artificial as with the movement of the natural teeth, the degree of success in both sciences as has been said, will depend solely upon an intimate knowledge and appreciation of natural conditions which can only be attained by a close, intelligent and experienced observation of the varied forms of dental and facial relations which arise in different types of the genus homo. And while some will invariably attain to a higher degree of excellence along the art side of their work, because of certain inborn qualities, than it is possible for others, still as the paper has most perfectly expressed and shown, there are certain underlying principles which all may grasp and apply, and which should be thoroughly taught as an applied science, before we can hope to arrive to that higher plane in this department which the essayist hopes for.

The principal reason why we can not always hope to attain the same perfect results in the correction of facial outlines, in prosthesis as in orthodontia, is because of the impossibility of producing an artifical framework for the overlying features beyond a comparatively limited dento-facial area, on account of the position of attachment of the labial and buccal tissues, and consequent functional activity of the encroaching muscles; whereas, in the scientific movement of the natural teeth and surrounding alveolar process no such restrictions exist; and moreover, this movement may at times be made to influence the growth and proper development of even the true bones in outlying areas quite extensive in its possibilities of developing or perfecting facial contours. In the one instance the operation being performed principally during the early years of adolescence, nature may be expected to accomplish a large share of the work, whereas, with the other, the operation being performed for adults principally during a more or less advanced age, must depend solely upon the almost immediate benefit which the artificial denture produces.

There is another important difference in the art side of the two branches: In orthodontia we do not hesitate to place the teeth in the most perfect alignment, occlusion, and esthetic relations possible, because we are dealing with natural teeth and gums which no one is ever expected to imagine are false, or if they should, it would be construed rather as a compliment to the work; whereas, in prosthetic dentistry one of the principal objects of the operator should always be to produce a denture which so closely resembles conditions that would commonly and naturally obtain, with the special environment of the case, that the artificial will not be suspected.

This does not—or should not—consist in insisting upon any cut and dried mechanical rules relative to the anatomically typical, nor upon extensive attempts to reproduce the classical in facial outlines. By this I do not mean that dento-facial deformities which may have previously existed with the natural teeth should be always copied or preserved, but that in any attempt to fully or partially correct them by prosthesis, the bounds and possibilities of the artificial should never be overstepped to an extent that will cause a doubt of its naturalness, to say nothing of the probability of such efforts to detract from the functional uses of the denture.

This point is well exemplified in the too prevalent practice of insisting upon placing the teeth of upper artificial dentures in normal occlusion with prognathic lower natural teeth, and more commonly in typical relations to lower artificial teeth, where every outline of the features and antero-posterior relations of the upper and lower jaws plainly indicate that the natural upper front teeth closed far back of the lower. Of course, there are exceptions and happy mediums, that should be fully outlined in teaching, relative to the varied conditions that arise and that which may be advisedly attempted in the artistic restoration of facial outlines.

Students often ask: "How are we to be guided?" Nor is it strange in view of the fact that most of the teaching along this line is based upon the facial outlines of classic art, commonly exemplified by a profile picture of the Apollo Belvidere, which purports to represent the outlines we should always endeavor to copy. And while I do not undervalue the importance of a perfect knowledge of esthetic facial outlines as one of the bases of prosthetic art, it is of far more importance that we possess an intimate understanding of the outlines of the dento-facial area in its relation to physiognomies which we are more commonly called upon to restore, and which can only be attained by an intelligent and oft-repeated study of the different facial types in adult and advanced life which surround us everywhere. Specifically the natural relations and contours of the limited facial area it is possible for us to change in dental prosthesis, as compared to the principal feature of the physiognomy.

Students should be given a basis for this self-training of the mind through observation, by the exhibition of photographs thrown upon the screen of distinctively different classified types and characters of physiognomies, accompanied with proper instructions, that they may become intimately conversant with artistic facial anatomy; particularly in regard to the dento-facial area and its immediate relations—the lines, contours and depression which naturally arise in different ages of adult life, and with those of contained natural teeth and edentulous mouths—being particular to point out the facial lines which may be effected in prosthetic art. This knowledge will stimulate the habit of careful observation in that broader and more truly developing field, which may be found as it has with me, one of the most interesting studies of an otherwise unoccupied mind in a large city during local transits, where it may be employed inoffensively and unobtrusively.

Here will be found every form of malrelation of the upper and lower jaws and other features as compared to the esthetic which we could rarely, if ever, hope to bring to anything like a classic type. The most that should be attempted therefore in the restoration of the dento-facial area by prosthesis is to bring about conditions which might nautrally obtain with the special type of physiognomy under treatment. Restore and perfect the beauty of the facial outlines as much as possible, but never at the expense of more important demands, nor to an extent that must lead to a recognition of the artificial.

To successfully accomplish the most desired results, demands a high order of judgment, skill and artistic ability, the foundation of which, as the essayist has forcibly expressed, will largely depend upon the individual training of the mind in that close and careful observation of nature's ways and methods.

I need not attempt to enlarge upon that which the essayist has so perfectly expressed along other lines further than to say that the forms and sizes of natural teeth are not always in accord with temperament or massiveness of the frame, nor are they in proportion to the arch sizes of the resorbed maxillary ridges; as the latter may have been governed by abnormally or artificially contracted or expanded dental arches.

One of the principal faults with dentists who are influenced by the judgment and desires of patients, is to select teeth which are unnaturally small and white; on the other hand, many striving for the natural in appearance will overdo the matter in the other direction.

One of the greatest bars toward artistic progress in this department has always been in the thoughtless acceptance and application of the stereotyped unnatural products of manufactures.

I am therefore pleased to see that advanced prosthetists are awakening to the realization of the fact that natural teeth present decided variations from seeming rules in relative forms, sizes and colors, and that the production of the most natural in appearance can rarely, if ever, be attained by the employment of a single stereotyped set that may be purchased, but rather one which is made up from an intelligent selection from a number of such sets.

The forms and sizes of natural teeth as in other features of the human anatomy upon the right and left sides are rarely, if ever, absolutely alike and in many instances natural sets which we denominate as perfect, will be found to be quite decidedly different in this particular.

One of the most surprising advancements along this line over that of our preconceived ideas of former years is that in relation to the variations in the colors of natural teeth. This was first systematically presented by Dr. E. A. Royce in a paper read before the Odontological Society and published in THE DENTAL REVIEW, which should be carefully studied and its teachings applied by every prosthetist who is striving for the highest attainments of his art.

It is in these small details and elements of nature's ways which go to make up the whole, that characterizes the difference between the highest art and that of mediocre success.

The ordinary observing mind may not be able to define and possibly may never know why a certain set of teeth which is supposed to have been skilfully constructed, is at once recognized by them as artificial, but they are quite as sure of it nevertheless; which is but one of the many illustrations of that intuitive knowledge which stamps itself upon the mind whether we will or no, by the unavoidable observation of natural laws and phenomena.

DR. B. J. CIGRAND:

Mr. President and Members of the Chicago-Odontographic Society—I consider it a very high compliment to be placed on the list with those who are to discuss this most excellent paper, and you will pardon me if I add a word of commendation. I doubt whether any one in this room, unless he has gone somewhat over the same road that has been traveled by our essayist, can begin to realize the work that is enshrined in the pictures he has given us this evening, for in one sentence, I can contain my opinion; he has given us a masterful classification of the subject.

The views of the greatest anatomists on this one subject, the face have differed for years. Some anatomists have claimed that the face begins at the superciliary ridges, including the eyes, nose, mouth and chin; but more recent anatomists have included the forehead. Some anatomists claim that the forehead is contained in the face, and I rather believe that the classification of the forehead as a part of the face is most acceptable, and is valuable to us who are studying dentistry, since we look upon the lower third of the face as our special dominion.

The portrayal of the face both in its preservation, conservation and reproduction has been a theme in which the human race has been interested from time immemorial. The Egyptians tried to preserve it by placing it on pryramids and pillars, while the Phoenecians painted it on precious vases. The Romans tried to hold it among earthly things by embossing it or placing it in relief on metal; and yet they have simply striven to do the same thing we are trying to do today, namely, to preserve, conserve and to keep it for an indefinite space of time; though our professional purpose is in preserving it during the time of life. The Ancients have all had various ideas as to the ideal face. The word ideal to me is a peculiar word. The word ideal to me is very much like the word moral. The word moral has so many meanings. The moral law of one town is not the moral law of another. The moral law of one State is not the moral law of another one; the moral law of one nation is not the moral law of another country. Some things that are done in the United States would be considered immoral in Spain, and people there can do things which we would consider immoral. And so the question of morality is largely one of geography. So it is with the word ideal. What is ideal to me may not be at all ideal to you. We all have our idea as to ideals of the face. The ideal face of the Egyptians was a long, straight forehead, but equally poised, with obliquity of the nose. The ideal face of the Greeks was a small, straight nose. The ideal face of the Romans was one blazoned with a large nose. Hence every nation has its own idea of a face, and the older nations all worshipped the face, or at least some feature or phases of it. As I have said, the Egyptians worshipped the forehead; the Grecians the nose; the Romans the eyes; the Gauls the jaws; the English the hair, and the French the lips. Every nation has worshipped some particular feature of the face, and each claims to possess a composite or certain ideal face. I am lead to believe we are still largely at a loss as to what is in truth the ideal face. The archaeologists tell us of the ideals of the face in those olden days, and recent discoveries bring to the surface things that indicate clearly what the ancient artists, literati and scientists loved and admired. But I believe we are today living in a more truly art and science age. Theirs was largely crude. They could not decipher or analyze the face, nor had they as perfect an ideal of the face in their minds as we have today. Why? Because they worshipped absolutely the superstructure. They of the ancient world knew little about the basic structure or fundamentals of osseous architecture with its muscular clothings. Anatomy was unknown to them. They could not speak of the various muscles to which our distinguished essayist has so knowingly referred, because anatomy was an unknown feature of their life's study. They did not comprehend the vital element in physiology. The discovery of the circulation of the blood by Harvey gave the world the secret of tissue change and organic evolution. Unlike the Ancients, we understand facial composition, and it was not until we dissected the face that we began to determine what produced the superstructure or what influenced its form; and for that reason alone we are in advance of the Ancients, because our knowledge is based on science, not on art. Anatomy is a science, so is physiology, as is dissection, consequently our worship of the face is based on science, supported by investigation.

As to rules, I wish to say that I am less eager than Dr. Turner in allowing the patient to determine what the teeth shall be. Invariably a patient will say to you, "My teeth were small. They were white. They were beautiful." That is the patient's own recollection of them. Of course, we should consult them and inquire into their wants, but as for depending upon their judgment, I would say no. Hence, be less artisan and more artist. It is possible that the face of some relative in the family bears a striking resemblance to that of the patient, and this may aid us in our work. We should not place too much reliance, however, on what is said with regard to the description of the face by the patient. Most women have an ideal face, in their own mind, and this might apply to men as well. Woman has an ideal as regards her teeth before she lost them. She will say that they were the finest she ever saw. I rely very little on photographs, because the modern photographic artist has killed the art of facial expression. The old-time daguerrotype that left the marks on the face where God implanted them, or rather where we assist in planting them is much more reliable than the photograph of today. I do not agree that all these lines should be eliminated from the negative or the face. The photograph of today takes all the lines of character and smooths them out. There is no naso-labial fold. The subject is just as a beautiful piece of white marble statuary of an infant. There are no lines to be seen, such as exist on the face of itself, and so I do not depend very much on modern photographs unless they come to me untouched, or better proof impressions.

I quite agree with Dr. Case that rules must not be too rigid. The ideal face is something we are still dreaming over and doubting about. We have not yet agreed upon it. The Germans claim that they have an ideal German face, or one typical of the Saxons; the French people claim that they have an ideal French face. And so it is with the English. But you doubtless remember that some months ago some one offered to pay a reward of $10,000 to any artist who could produce what would be known and accepted as the strictly, typical American face; and up to the present time no one has subjected himself to the task of accepting that $10,000. So we are still in the woods as to the classification of the ideal face at least for our own country.

Dr. Turner has given us a splendid paper, covering great territory.

Oliver Wendell Holmes, who has done so much for us in this same direction, paid this compliment to the mouth: "The corner of the mouth is a truer index of character, a more perfect emblem of a man's soul, than his eye and all the rest of the face put together, because," he said, "the eye may say what you might have been, but the corner of the mouth tells us what you are." Oliver Wendell Holmes believed in the study of the face. The works of Gall, Spurisheim and Comb are valuable authorities. There are some men who have such striking lines in their faces, such as the face of Abraham Lincoln, or the face of the late President McKinley, that to wipe out these lines would mean to set aside their character. I believe in some of these facial lines remaining. I do not believe in smoothing them all out and making them symmetrical, oval and beautiful. I hold it good prosthetic principle to know how and where to preserve these lines. They are not so pretty, it is true, but they still mean much to such as prefer character to superficial beauty.

Just a word or two more in conclusion. The artist who paints a picture usually portrays on canvas that side of the face which he judges appeals to him as being the most beautiful and most symmetrical, so that his work is comparatively easy as he devotes his attention largely to one-half of the face. The sculptor in his work tries to preserve the entire face; he cuts it out of marble or stone, and portrays both sides, having simply one fixed form in view, possibly with the lips closed. But our work as dentists is more difficult than either. As I have said, the artist portrays but one side of the face, or possibly a fraction of the other; the sculptor portrays all of it, but in a given form and unchanging attitude, while the dentist must so arrange the face that it will be symmetrical, esthetic, beautiful, harmonious, corresponding with the great laws of nature in all the variations of facial expression as superinduced by muscular distortion and contortion. So we as dentists have a harder task to perform, although our efforts in this direction may not seem appreciated as much as they ought to be by the general public, when we render artistic scientific service our patrons liberally accord commendation.

Some time ago a prominent dentist made the statement that dental prosthesis, operative dentistry and dentistry as a whole had reached its highest point of perfection; that nothing further would be accomplished; that nothing new would come of it; that we had gotten up where there was a dead level. You will remember, that when the Queen of Sheba reported to her people about the grandeur of the great Temple of Solomon, she said that "The half hath never been told." I want to say, in compliment to our essayist, who has taken another step from the plateau upward and forward, in paraphrasing the words of the Queen of Sheba, that we might well remark "the half has not yet been done." I do not believe we are stopping. I do not believe we have reached the highest point in this branch of our art. But I am convinced that we have just begun. All these discussions will bring new light and new life, and my compliment is to thank the essayist for the admirable paper he has presented to us this evening, and God bless him for coming here.

Dr. J. H. Prothero:

Mr. President, Dr. Turner and Members of the Society—Unfortunately I was unable to secure a copy of the essayist's paper until late this evening, and have been unable to read it through as carefully as it deserves, therefore I am not prepared to enter into the discussion of it in as finished a manner as have Drs. Case and Cigrand.

The principles as outlined by Dr. Turner are, in my opinion, a step forward in this field. I do not, however, want to create the impression that we in the West have not been giving this subject the consideration it deserves, because there are scores of men in Chicago and the Northwest who are striving to carry out the ideas presented here tonight by Dr. Turner.

The paper is one of the most comprehensive and concise contributions on this subject presented to the profession, and I wish to thank him from the bottom of my heart for thus favoring us with the results of his efforts.

The title of the paper is to my mind somewhat misleading, "Prosthetic Dentistry as an Applied Science." Dr. Turner presented general principles and statements at first, and then settled down to a discourse on the esthetic field in dentistry. We must consider that prosthetic dentistry is an applied science, or in other words, it is the application to dentistry of two exact sciences, chemistry and metallurgy, together with the esthetic and the industrial arts.

Industrial art is called for in the construction of substitutes and restorations. The esthetic art enables us to give the correct form and contour to restorations. The first is subject to rules, the latter, while subject to, yet at times transcends all rules as conditions require.

The point mentioned by Dr. Turner that we can not lay down rules whereby facial restoration may be accomplished to the fullest possible extent is a true and important one.

In regard to the ideal face, I can not conceive how it is possible to agree upon one of a fixed type, since the ideal of each individual differs from that of another. No two human beings are exactly alike. The color of the hair, the eyes, the teeth, the general form of the face or the complexion differs in some respects from every other individual, but if we understand the esthetics of our profession, if we have studied art from the artist's point of view sufficiently, and have assimilated what we have studied, we will be able to recognize the form and color of teeth appropriate to each individual case that comes to us, and to restore lost contour in such manner that the result will be harmonious.

We should study dental esthetics and encourage others to do so, for to my mind this covers an important field that is much neglected by the dental profession today.

I wish to thank Dr. Turner for presenting this very able paper, and also the society for placing me on the program to discuss it, but regret that I had so little time to prepare for it, for it is a subject nearest my heart, and one in which I have taken great interest.

Dr. G. V. Black:

Mr. President and Gentlemen—I can add very little to what has been said this evening other than to express my appreciation of the paper, and particularly my appreciation of the effort that has been made in this direction, which, I fear, has been much neglected by very many who are practicing dentistry today. There is no part of dentistry in which so much skill may be displayed as in the restoration of features that have been marred by the loss of the teeth, and the man who undertakes this work should be especially a student of the features, not so much possibly of the ideal face as of faces and cases, and particularly the restoration of the best expression both in a state of rest and in mobility of the face presented before him in his patient. In this consists very largely the art that has been portrayed to us this evening. Faces differ, and yet there are certain points and features that have been expressed tonight, which, if we study carefully, we will do better in the restoration of those features that have been lost. It is not simply the face at rest that is to be studied, but it is the mobility of the muscles, the face in motion, as it were, the face in expression throughout, that is to be restored and brought back to the best possible standard for that particular individual.

There is much in prosthetic dentistry aside from this, and we need men who are specialists in this direction. Having said this much, I wish to thank Dr. Turner for what he has done for us this evening.

Dr. L. P. Haskell:

Mr. Chairman and Gentlemen—I did not expect to be called upon to participate in this discussion. I do not feel competent to discuss this paper. I want to say, however, that although I have been practicing this one specialty for so many years, I have always been learning. I have learned tonight. I expect to learn as long as I live. I have gotten some new ideas from this paper, which was interesting and instructive. It is a paper that needs to be studied. It can not be comprehended in one evening, not by any means.

It is astonishing to see the number of artificial dentures in the mouths of people, on the streets and elsewhere, that have been inserted by men who have not the least conception of what an artificial denture should be. I wish to speak especially of one great fault in artificial dentures. They are so universally too short. I rarely ever see a mouth wearing artificial dentures that are too long, but there are thousands that are too short, and oftentimes you will see a person wearing a full upper and lower denture with the mouth in a perfect state of collapse, even looking as if they had no teeth, yet they are wearing artificial teeth. I do not know why it is dentists have such conceptions of artificial dentures.

As to artificial dentures, it is impossible in all respects to reproduce them so as to be typical of the human organs in all respects, because we are dealing with a condition of things in an edentulous jaw, where it is impossible to arrange the teeth in all respects like the natural teeth. The closure of the teeth is all important. The primary use of an artificial denture is mastication. Oftentimes a patient has only the lower anterior teeth, and say they do not want the lower posterior teeth. I frequently say to such a patient that he or she may just as well undertake to run a coach with three wheels as to have an upper artificial denture, with nothing on the lower jaw but the anterior teeth, for they can not masticate with the anterior teeth, but must wear a lower partial denture. I have said to patients that if I had no more trouble with lower sets than with upper ones, I would be happy. After you have done your best say to the patient, "In all probability that lower plate is going to cause irritation because the membrane of the lower jaw is more sensitive than that of the upper, but come and have it relieved." In many lower jaws absorption is constantly going on, so that there is nothing left but a flat, narrow ridge, and not only the muscles, but glands and loose integument under the tongue are elevated when it is raised. If the plate is extended deep on the lingual surface it is displaced. There are thousands of lower plates being worn by patients that are a perfect nuisance because they are moving up and down. It must be cut away on the lingual side until no longer lifted. The patient must be told that it takes longer to learn to use a lower denture than an upper one. I am speaking now from my own personal experience. I have had ten years' experience with a lower denture, and I know what it is; in fact, I know more about lower dentures now than I did ten years ago. It is not a pleasant experience. The plate I am wearing at the present time is perfectly comfortable. I have been using it without difficulty. If you could see the width and shape of the lower plate, you would wonder, as others have, how the plate could be worn. The trouble now is that my teeth are too short, as the anterior teeth were extracted long after the posterior teeth were, and the plate keeps settling. As the anterior teeth settle it leaves the posterior teeth too long and they must be shortened. After a time there will be a flat jaw, and the plate slide forward, so the anterior teeth come in contact with the upper and must be shortened because of their interference. So now the teeth have become quite short and I need longer ones. I have been struggling with the problem of a lower plate, and it is not a very pleasant experience, because the plate I am wearing is comfortable. I have no trouble whatever in using it, but the breaking-in of a set of longer teeth is a problem. Looking for a first-class prosthetic dentist to give me some advice in regard to my lower denture I have consulted by friend, Dr. Perry, hoping he may aid me.

Dr. E. J. Perry:

This is probably the best paper that it has ever been my pleasure to listen to upon this subject, and I most heartily congratulate the society on having Dr. Turner here and presenting this subject in such an exhaustive and interesting manner. It would be presumptuous upon my part to attempt a discussion of it, as I have not seen the paper; at least, I have not read it. I have only heard it this evening, consequently I could not take up any of the propositions which have been advanced by the essayist and discuss them in justice to him. However, I will say a few words, since I have been asked to do so.

The hang of the tooth, as I term it, and the selection of the tooth are two important things to be considered when making an artificial denture. The selection of the tooth, I believe, is invariably determined by the physical organization of the individual. Some time ago I wrote a paper on the physical organization of the individual and his teeth, and I undertook in that to say that the physical organization of the individual indicated the kind of a tooth that he should have. Some criticism was offered to that, and now, as has been said by Dr. Case tonight, we know that Nature does not always put the right kind of a tooth in. We are so mixed up in this country that we can not produce an ideal face. All kinds of nationalities are brought together. If we get an English tooth or teeth, and a French jaw, we do not get an ideal face. I do not see that an ideal face cuts much figure anyway. If Nature does not put in the right kind of a tooth, and the physical organization of the individual indicates the right kind of a tooth, then you are inexcusable for not putting in the right kind of a tooth, that is all. If Nature made the mistake, there is no reason why you should.

I have two classes of individuals for whom I select colors—the brunette and the blonde. The brunette always has a blue-white tooth, and the blonde a yellow-white tooth—extremely so. If you will take your shade guides when these types of individuals appear in your office you will confirm this. In patients who are neither brunettes nor blondes, you will find that one type or the other is predominating, and you can grade the shades according to the predominating type. Of course, it is quite difficult to select a shade sometimes where the patient is neither a blonde nor a brunette, but if you will try them and be guided by this suggestion, you will find it is not a difficult matter to get the right shade by the help of the individual.

I agree with the essayist that the most valuable aid that we can possibly have is the patient. Of course, some patients are not very much aid to us. They do not know as much as others, but where we have an intelligent patient, and that patient sees that you are interested in producing an artistic piece of work in restoring the features, he or she is alive to the importance of the work you are about to do, and will give you hearty co-operation. You can place yourselves in accord with such patients. I do not believe any man ever made really an artistic set of teeth who did not have the co-operation and advice of the patient. Patients do know what they want. When they get the thing they should have they know it, and you should guide them to it.

There were several ather points that occurred to me during the reading of the paper which I would like to discuss, but the hour is so late that I shall have to forego that pleasure.

I wish to thank Dr. Turner personally for his admirable paper. It represents a tremendous amount of work. I was in hopes he would take up the articulation of the teeth and the grinding of them. I was also in hopes that coming from the city of brotherly love he had imbibed Dr. Bonwill's idea, and that we would get something fresh on that subject.

Dr. Truman W. Brophy:

I thank you, Mr. President, for the invitation to speak, as it gives me an opportunity to express to this audince and to the essayist of the evening my appreciation of his efforts along this line. At the dinner I asked the essayist the question, What does the dental profession most need? He hedged somewhat in giving an answer, and I can see now the reason why he did so. He has told us in this most learned exposition on the subject of prosthetic dentistry what probably in his judgment the profession most needs, and I believe he is right, for there is no department of practical dentistry today that opens up broader opportunities for young men than the department he has so ably discussed.

One more word. We find that the average dental student rather dislikes to engage in a study of this special line of work. In other words, he hesitates to do this. While he seeks the operative department with determination and zeal, here he seems to make a mistake. He needs a more thorough knowledge along this line of work, and if we can impress upon him the importance of doing this we can accomplish the best work for him.

I want to thank Dr. Turner for his presence in Chicago and for the paper he has presented to us, and wish to say to him that all of us keep our latch-strings out here, and we will be very glad to have him come frequently and stay longer.

I was in hopes that Dr. Rudolph Beck would be here this evening and say something about the use of paraffin injections with which much may be done toward restoring facial expression, as along this line I expect to see very marked improvements brought about throughout the country by Dr. Turner and his confreres, who are engaged in the department of prosthetic dentistry.

Dr. C. R. Jones:

I did not expect to say anything on this subject. However, there is one thing that impressed me more thoroughly than anything else, and that is in adjusting these cases that present themselves to us and in working on them, the case in hand is the thing before us and the thing we are to work on. No two of us ever see an ideal case alike. My ideal is not your ideal, and it would be impossible for me to construct a denture in such a way that it would come up to your ideal. It is the case in hand more than anything else that we work on, and each one strives to do what he considers ideal work. That is all I have to say.

I wish to thank Dr. Turner for the privilege of listening to his excellent paper.

Dr. Turner (closing the discussion):

I wish to preface what few words I have to say in rejoinder by an expression of my appreciation of your generous hospitality and of the extremely courteous and kindly reception which you have given my humble efforts in your behalf this evening. I can assure you they have transcended my fondest expectations and it would not be at all difficult to keep me here in Chicago permanently.

I wish to reply in general to the statements which have been made concerning my essay that my purpose in presenting it was not so much to emphasize the importance of the high ideals of art, as I endeavored to get away from that as far as I could, but I felt that there was some need for an acquaintance with the harmonies of proportion, form and color. I wished to use that only as a court of last resort to supplement the deficiencies in the data obtained in the individual case. If we institute our treatment from the standpoint of rational therapeutics, we should take each case and learn every possible point or detail in regard to it we can, than fill in with the knowledge obtained from observation, as Dr. Case has said, of those with whom we come in contact; finally, after we have used up all this information, we should utilize our knowledge of harmony of form and color to complete the procedure. In this latter particular I would call attention to one phase of the subject which is a good illustration of my point. If we attempted to follow natural conditions in our imitations, we should be restricted somewhat in the production of pleasing results. For instance, if we wished to represent the wear characteristic of the age of forty, we might go out and select a man who has a set of teeth worn in a manner characteristic of this age and imitate it. We might select a man the conditions of whose mouth would present a pleasing appearance; there would be a sort of balance, a sort of symmetry of the two sides, a correspondence in the sizes of the teeth. On the other hand we might select a man whose mouth would be natural, and yet if we reproduced that condition in an artificial denture it would not be pleasing to the eye. It is for this reason that I believe an acquaintance with the ideals of art as portrayed by great painters is important for it gives one an appreciation form, color and proportion.

In conclusion, Mr. President, I wish to say that I am sorry I can not allude to one or two more points that were brought out by the able discussers of my paper. I wish to thank them for the extremely courteous praise which they have given it.

THE DENTAL REVIEW.

Devoted to the Advancement of Dental Science.

PUBLISHED MONTHLY.

EDITOR: C. N. JOHNSON, M. A., L. D. S., D. D. S.

Subscription price $1.co a year including postage, to all parts of the United States and its possessions, Cuba, Canada and Mexico. All other countries $1.75 a year.

EDITORIAL.

COLLEGES AND STATE BOARDS.

In the May number of THE DENTAL REVIEW we published a brief history of the Wisconsin case with extracts from the Supreme Court decision, in which the powers and limitations of the board in that state were very clearly drawn so far as their jurisdiction over colleges is concerned. It was practically a service of notice on the board that its duty lay in securing information as to the fitness of a candidate to practice dentistry rather than to supervise the curriculum and establish rules for a college. This decision places the board and colleges in a more enlightened relationship to each other, and we trust it will result in a better understanding of the rights and duties of all concerned.

It seems to us that the time is now ripe for a most careful consideration of this entire question, to the end that the prolonged contention between the boards and colleges be brought to a close. This contention has given rise to much bitterness, has cost thousands of dollars in litigation, and has really stood in the way of the best advancement of dental education.

That some colleges in the past have been inefficient, no one will question, but that others have been struggling hard at the greatest possible expenditure of energy on the part of their faculties to bring their instruction to the highest degree of perfection is equally true. That some boards have been manifestly unfair and even dishonest has been amply proved, while others have been composed of men of the very highest honor and ability. But this does not justify the attitude on the part of boards that all colleges are open to suspicion and should have the rod held over them, any more than it does that the colleges should consider all boards antagonistic.

What is needed at this time is a frank coming together of all parties concerned and a free discussion as to the rights and privileges of the boards and colleges, with a determination on the part of all to so harmonize matters that dental education is not hampered as it has been in the past.

THE ILLINOIS STATE DENTAL SOCIETY.

This society now has a membership of more than 1,300, and is therefore the largest state society in the country. At the recent meeting at Springfield there were in attendance about 500 and the sessions were full of interest from beginning to end. A feature of the meeting was a complimentary banquet to Senator A. C. Clark, through whose influence the dental bill was passed a year ago. Governor Deneen was present and made a most impressive speech, and the event was one long to be remembered by those present. Senator Clark was made the recipient of a beautiful souvenir volume containing testimonials from all the organized dental societies and colleges in the state—a memento that any legislator might well be proud of. In this event the dental profession of Illinois has set a good example in showing public appreciation of worthy effort put forth in securing proper legislation for the protection of the people of the state.

Another presentation was that of a mahogany library table and a Persian rug to Dr. A. D. Black in recognition of his services as chairman of the re-organization committee.

It was a love feast all around and the meeting of 1906 will long be remembered by those in attendance. The officers of the society for the coming year are as follows:

President, Elgin MaWhinney, Chicago; vice-president, T. P. Donelan, Springfield; secretary, Arthur D. Black, Chicago; treasurer, Chas. P. Pruyn, Chicago; librarian, J. T. Cummins, Metropolis; program committee, C. L. Snyder, Freeport; clinic committee, C. N. Thompson, Chicago; chairman local committee, Henry L. Whipple, Quincy.

Next meeting, Quincy, May 7, 8, 9, 10, 1906.

RELIEF FOR SAN FRANCISCO.

The more we get of the details of the situation at San Francisco the worse it seems. At least 400 dentists have had their entire equipment destroyed and their source of revenue cut off. In many respects it will be worse than building up a new practice. Their patients are scattered and many of them gone for good. It will take months at the shortest for any of them to become self-sustaining. Let the profession all over the land stop and think what this means and then act accordingly. Fortunately it is only necessary for dentists to understand the situation to make them rise to the occasion and do their duty, and there seems to have been a spontaneous response from the profession everywhere. The Chicago committee has already raised in this vicinity about $4,000. But the work must not stop till every San Francisco man is placed firmly on his feet. To do anything short of this under existing circumstances is a reflection on the manhood of the profession, and we should see to it that there is no necessity for any of our brothers to accept assistance from any source except from dentists. It should be a family matter with us and should appeal to our pride in a purely professional sense. The San Francisco men are too brave and high spirited to let their real wants be prominently known, and it rests with us to take the initiative and generously offer our aid.

BANQUET TO DR. L. P. HASKELL.

On the evening of May 15, 1906, the Chicago-Odontographic Society tendered a banquet to the veteran specialist in prosthetic dentistry, Dr. L. P. Haskell. Dr. Haskell was 80 years of age on April 25, 1906, and has been in the practice of dentistry for 62 years. The tributes of respect and of love that were showered upon him at the banquet must have warmed his heart and made him feel that truly life is worth the living. The banquet was a notable success in every respect, and will long be remembered by the large body of dentists present. Dr. Haskell's paper, "Sixty-two Years of Dentistry," read on this occasion, will be published in due time in THE DENTAL REVIEW.

THE EDITOR'S DESK.

MY SUMMER VACATION.

[Continued from May Dental Review.]

THE FINAL CHAPTER.

We had not been many miles in Alberta before we came to Laggan and then to Banff. These are famous stopping places along the route as also are Field and Glacier. In fact at many of the points on the way up such as Sicamous Junction, Revelstoke and smaller places the traveler may find much of interest for a few days' stop over. Our party would have been glad to see these places in detail, but our time was growing limited and the hotels happened to be crowded.

The Bow River.

The water now runs with the train and we have by our side the beautiful Bow River, which is a feature of the scenery at Banff. We leave Banff about 10 p. m. and turn into our berths after a day of sightseeing which can not be duplicated any place on this continent, nor we verily believe, on any continent. We have been so entertained that we do not realize we are tired till we begin to prepare for bed. The night is cool, the berths commodious and comfortable, and—we know not a thing till daylight the following morning. When we awake and look out the car window we are transformed into another world. Instead of mountains there is a perfectly level plain as far as the eye can see—and the eye can see over an almost limitless expanse in this atmosphere—with not a tree, not a house, not a solitary thing in sight. I am not quite certain at first which is the more impressive, the mountains or the plains, but I am at least assured that it is a positive rest to have the change. And yet I do not wish to imply that I ever weary of Nature in any of her manifestations. Whether the mountains or plains, lakes or valleys, whether the rippling rill by the wayside or the vast and solemn majesty of the sea, it is all the same to me—Nature has my respect, my reverence, my worship, and my love.

We reach Medicine Hat, Assiniboia, about 7 o'clock. Here is a fine town, well kept and apparently prosperous, but the marvel is what keeps it up. We soon begin to run by lakes, and wherever there are lakes there are multitudes of ducks and other water fowl. But the lakes are often far apart. In the mountains the railroad people have to fight the water, but here they have to fight for it, and the train frequently stops at a lone water tank with no station, and no need of a station, in miles. At one such stop an amusing thing happened. There was a small lake near and as the train halted a passenger in the forward car began popping at the ducks with a small rifle—which the ducks, by the way, did not deign to notice. He fired two or three shots in quick succession, when the editor of a metropolitan paper who had his family in the state room of the sleeper rushed out excitedly and looked around with eyes as large as after dinner saucers. Upon surveying the field he returned to the stateroom with the comforting statement to his wife that it was not a hold-up after all.

As we approach Moose Jaw we begin to come into the wheat country, and from this on to Winnipeg, Manitoba, the land is for the most part fertile. It is through this region that the famed wheat fields of the Northwest are located and there never was a better district laid out for the hand of man to cultivate. Winnipeg is growing rapidly and has already become the established metropolitan center of western Canada. From Winnipeg east the country changes, and we have not gone 100 miles before the rocks begin to crop up out of the soil. We see ox teams of the most primitive sort, and the landscape is wild and rugged. As we near Rat Portage in the far western arm of Ontario, we pass numerous small lakes—so many in fact that I am reminded by contrast of the eastern shore of Georgian Bay. Here we have a body of water studded with numberless small islands, while in western Ontario we have a vast landscape dotted with beautiful lakes. By the way, the name of Rat Portage has recently been changed to Keenora—more's the pity. It may be more euphonious and more modern, but I don't like modern things. The chief charm of this entire trip is its nearness to Nature, and I am inclined to resent anything artificial.

In one of the lakes we see a rock with a small tree about two feet high growing on it. It is green with foliage but is no bigger than it was when first discovered by the surveyors of the road, which may well be accounted for by the fact that a close examination fails to discover the slightest earth on the rock and not even a crevice for the roots of the tree to cling to. Speaking of trees reminds me that for years I have annually been wasting sympathy. Every autumn I have noticed that the last sailing vessels entering Chicago have brought great loads of Christmas trees, and I have deplored the fact that the forests have been desecrated by sacrificing so many of these young trees, but since this trip I have revised my sentimental lexicon, and the children may have all the Christmas trees they want. We saw enough of these trees to supply Christendom and have sufficient left over for seed.

We touch Thunder Bay on the north shore of Lake Superior at Fort William and Port Arthur, and from this point we skirt the rocky shore of the greatest of the great chain of lakes for many miles. Nothing wilder than this can be imagined. Game is abundant and may be seen from the train. One of the waiters on the dining car showed me where they had seen a moose on the trip up, and when I asked him about deer, he said: "Oh, them things, they are everywhere—they bother us getting on the track." And one can well believe this in looking at the region. As our train ran along at one point a buck and doe were seen moving leisurely off through the underbrush. It seems at times as if we must be hopelessly beyond the bounds of all civilization, and yet at the very farthest points we are kept in touch with the world by daily bulletins of all the important events through the agency of the C. P. R. news service. I am not quite sure that this was to me an inducement. I was relaxing so luxuriously in the marvelous display of primeval nature that I rather resented any intrusion from the outside world, and yet so strong is the ruling passion in the modern newspaper-spoiled mortal that I instinctively held out an eager hand whenever the bulletin was brought on the train.

At North Bay we change sleepers for Toronto and arrive there precisely in one week to the hour from the time we left "Fairview" at Alkali Lake. We have been continuously on the sleeper for four days and five nights, but the general verdict of the family is that we are not in the least tired. In fact the Indian Girl asserted that she would willingly take the trip over again for one more good horseback ride across the mountains.

That same afternoon I take the train for my old home, about fifty miles northeast of Toronto—the place where I was born. It is here that the sun shines a little bit brighter, the birds sing a little sweeter, the grass grows a little greener, the whip-poor-will down by the river in the moonlight chants a clearer note and Nature is altogether kindlier and more mellow than in any other place on earth. And it is here that for two precious weeks I renew my youth and revel in memories—memories far and memories near—memories of the days when the world looked wide and the distant city was a mere phantom of light, an impossible elysium—a wonderland, long since stripped of its glamor and laid bare in its tawdry dress. It is here that I sit in the little front room by the window and dream of our recent trip, dream of all the happiness that has been abundantly ours and try to tell the story, however haltingly, for those who care to read.

But all things transient like vacations must come to an end, and one day we take the sleeper for Chicago and the next morning are once more in the bustle, hearing the same old sounds, and facing the same old problems, but not quite, we hope, in the same old way. Whatever may come of stress, and soot, and noise in the coming months we are secure in the refreshing memory of an ideally perfect rest, and this memory can never quite be taken from us.

We have been gone two months, have traveled by rail and water about 6,000 miles, and by coach, carriage and horseback about as many hundred more. We have seen hail on the mountains in August and heard of hundreds dying of the heat in distant cities, but we have never been rained on once nor suffered an oppressive day. If any of my readers have had a better vacation than this, I cheerfully send them my greetings, and—my congratulations.

THE END.

[Note.—The editor can not close this series of vacation articles without a word of thanks to the many readers who have so generously written him in commendation of their merit. These letters have been as much a surprise as a pleasure. The articles were inaugurated in a spirit of experiment and with some hesitation as to their applicability to a dental magazine, but strange to say they have appealed to our readers in a wholly unexpected manner, and the result has been altogether satisfying to the writer. They had not been running long before appeals began to come in to have the series appear in book form, and this appeal has became so general that it has finally been decided to bring this about.]

DOMESTIC CORRESPONDENCE.

NEW YORK LETTER.

New York, May 15, 1906.

My Dear Mr. Editor:

The New York Odontological Society held its April meeting at the Academy of Medicine. The subject of the evening was "A Paper on Orthodontia," by Victor H. Jackson, M. D., D. D. S., of New York city; the discussion to be opened by Dr. J. Lowe Young and Dr. R. Ottolengui.

Dr. Jackson described in detail his method of correcting irregularities, which method is essentially Dr. Jackson's, and is described at great length in his book on Orthodontia. This paper seemed to deal more with how he would make certain appliances, rather than with any particular principles underlying the work. He presented several models of work at present under way. The discussion was short and did not present anything new.

At the regular meeting of the New York Institute of Dental Technique, Dr. P. B. McCollough, of Philadelphia, presented a paper on "A System for Artificial Substitution of a Single Missing Tooth," describing his method and illustrating it as he progressed. We can not well describe it without illustrations. The discussion was participated in by Drs. H. W. Northrop, J. Bond Littig and E. Parmley Brown, each one being well known for work along this line.

The New York Institute of Stomatology held its regular meeting May 1.

In communications on "Theory and Practice," some information was desired by one of the members concerning "Painless Dentistry," if such existed, but not much light was thrown on the subject.

The essayist of the evening was then introduced, R. R. Andrews, D. D. S., F. R. M. S., of Boston, Mass., who read a paper on "The Formation of Teeth, and the Reason Why the Protective Covering Is So Often Defective and Deficient," which was illustrated with a profusion of the finest lantern slides we have ever seen. Professor Andrews, in his own characteristic manner, described in minutia the process of formation of the teeth and presented many causes for their impairment, illustrating his address with slides, which showed very clearly that which he described.

At the Central Dental Association meeting at Newark, N. J., April 16, Dr. G. Lenox Curtis read a paper on "A Plea for the Uniform Treatment of Alveolar Abscess." The doctor handled the subject quite elaborately and although it was discussed to some length the salient feature—a plea—was not discussed as it should have been. Dr. Curtis said that although the crude methods of our predecessors have been improved upon until they have crystallized into a system of approved methods of which we, their successors, may well be proud, there is one very important subject that is quite frequently presented in the practice of every dentist that seems to have been neglected, that is still surrounded by a great diversity of opinion as to the best method to be employed in its treatment. It is the disease Alveolar Abscess. Every dentist seems to have a method of his own, which is often radically different from that of his fellows. It is not at all remarkable that the results from the use of many of the methods employed should be nothing but failure.

How does it happen that in all these years of progress the proper method has not been found, promulgated and properly taught by the professors of operative dentistry in the different colleges?

"The deplorable lack of uniformity is largely, if not altogether, due to the fact, that each professor teaches the method he practices, and as I understand it, without regard to the methods stated in the text-books used in his college, which may be radically different from his method. The inevitable result is that the ideas of the students become confused and they are as liable to adopt a good as a bad one."

Dr. Curtis then proceeds to outline a plan for introducing a uniform method of treating the malady which would overcome the above difficulty.

"Let the National Dental Association offer a prize for papers, setting forth the best method for treating alveolar abscess in all its stages; the merits of these papers shall be decided by three judges, selected one each from New York, Chicago and Philadelphia, the three principal centers of dental education, etc. The Association of Dental College Faculties should, upon request of the National Association, agree to recommend the method adopted by the judges and see to it that all colleges teach it at least for a period of years or until a better method is developed. The National Association should give the method receiving the prize as much publicity as possible and practitioners thoroughly instructed in the method should be sent to the Dental College Faculties from college to college to impart it in all its details to the professors of operative dentistry and it should be the duty of the practitioner so sent to be present when the professor teaches the method to the student, etc."

The doctor then outlined in a general way his method of treating the disease when presented in some of its forms. He deplored the too general practice of extracting abscessed teeth.

The best description of an alveolar abscess he found was given by Dr. Farrar as follows: "The gases arising from the putrescent pulp are forced through the apical foramen where the pressure distends the peridental membrane which thus becomes the walls of the abscess.

"At times septic irritation is sufficient to create a cystic tumor large enough to destroy all of the bone of an upper or lower jaw.

"The old method of treating alveolar abscess consists in enlarging the apical foramen, and through the orifice so made force the medicine employed into the sac of the abscess which has no outlet.

"Could there be a more stupid and blundering process than this, resulting in a long and painful course of treatment and—failure? The above method I know from personal observation is very often employed."

Dr. Curtis recommends the more general use of the x-ray for examination of the teeth and better diagnosis of disease. "By placing a very fine wire in the canals of roots before the radiograph is made the wire will show exactly the distance each canal has been opened and how much has not been opened."

As to the treatment. He says the first step in the treatment of any disease consists in locating and removing the cause. When this has been done, the removal of the disease and its consequence is usually a comparatively easy matter.

Dr. Curtis dwelt to some length on the proper opening of canals, recommending that enough tissue be cut away to facilitate free access.

"The successful treatment of alveolar abscess requires greater judgment and skill than any other dental operation."

Drs. Atkinson, Farrar and J. B. Rich are given credit for their works on the treatment of this disease. Dr. Rich was present in all his vigor of 96 years.

Dr. Curtis laid stress on proper access to canals. He said that not more than one per cent of the cases referred to him have the canals opened in a proper way. "I believe that there are not more than five per cent of the dentists practicing now who are capable of opening even the simplest canals.

"About ten years ago before the Second District Society I discussed Dr. Rhein's paper on this subject and demonstrated the impossibility of opening the canals of all teeth to the apex which he declared he could do. This string of teeth I now exhibit is the one I used at that time to prove the incorrectness of Dr. Rhein's assertion.

"My way of procedure after exhausting every means at hand to reach the apex of the root is to fill the canals as far as opened and to amputate at the point of filling, removing the portion cut off.

If a painless operation is essential I inject into the gum a saturated solution of cocaine; first giving the patient 10 gtts of volasem, which is a perfect antidote and without which no more than a two per cent solution should be used.

In washing out debris, Dr. Curtis uses peroxide of hydrogen, if the orifice is large, or electrozone or saline solution. One or two days is all that is necessary for treatment of minor cases. Two to eight weeks may be required for more serious ones.

Dr. Lucky opened the discussion. He believed the plan of appointing dentists by the National Association an admirable one.

"Prolonged treatment he thought was usually the cause of failure. Dr. Lucky said he had been wondering which class be belonged to, the five or the ninety-five per cent. He has discovered that the professional extractor gets his business from the ninety-five per cent class."

Dr. Rich said that in his long practice, 63 years, the most difficult thing he had to deal with was alveolar abscess. It requires more skill, time, patience, etc., than anything else we have to do. He asked the question, "Why is there no positive method in this advanced profession?" The amount of teeth lost is almost equal to those saved.

After 70 years of treatment we are not able to do so successfully. Ought we not to be ashamed of that?

The professors of our colleges are accountable for the present condition. What man can say that the dead tissue he allows to remain will not or can not cause trouble. His practice was to fill canals with Canada balsam.

Dr. Watkins spoke of Dr. Curtis' plan as the first step in the direction of universal treatment. He was delighted with his positive way. It is a grand thing always to listen to a master.

Dr. LeRoy and Dr. Sieberst, of New York, and Dr. Morrison, of Montreal, also discussed Dr. Curtis' paper.

Dr. Curtis, in closing, said the remarks of Dr. Rich surprised him by their up-to-dateness. "They were really better than the paper itself." College teachings, he thinks, are most at fault. The professors are at fault; he excepts none.

New Jersey has always prided herself on having kept politics out of all matters pertaining to dental legislation, and her record in that respect for the last thirty odd years has been an enviable one.

When this winter past, a bill was introduced in the legislature placing the appointment of members of the State Dental Examining Board entirely in the hands of the governor, there was a great "hue and cry."

Heretofore, the State Society in annual session selects, and the governor was obliged to appoint such selection. It fell to the lot of Senator Everett Colby to present the bill in the Senate. Senator Colby is known as the "rising young reformer of Essex county," and has had the honor of being heralded as such by McClure's magazine among others, but the Jersey dentists think he has made a great mistake, and he was scored at the C. D. A. dinner at the Continental hotel, because of his support of the bill. Mr. Colby was the only Senator to vote for the bill in the face of protests from a large number of dentists of Essex county.

Dr. Lucky, of Patterson, brought the matter before the meeting. He said: The bill was introduced surreptitiously into the House of the Assembly and none of the Board of Dental Examiners knew anything about it until it got to the third reading in the Senate.

After a severe arraignment of Mr. Colby, Dr. Lucky introduced a resolution condemning the dentists who were responsible for the introduction in the Jersey Legislature of Assembly bill No. 271, the purport of which was to remove the appointing power of members of the examining board from the State Dental Society to the Governor, thus bringing the appointments into state politics and thereby nullifying the work of twenty years in advancing dental legislation.

Mr. Colby tried to explain his position, but it was acknowledged to be weaker and worse than the original offense.

Sincerely, THE BOROUGHS.

May 2, 1906.

To the Editor of THE DENTAL REVIEW:

Dear Sir: In the May issue of your journal for the current year there appears an interesting article on "The role played by certain acid derivatives of lactates in the erosion of the teeth," by Dr. George W. Cook, of Chicago, and to which article you editorially draw attention, all of which I have read with much interest.

I find at page 462 the following statement: "Professor Kirk in a recent paper has put forth the idea that erosion in general is due to lactic acid. His experimental evidence, however, it not sufficient to warrant general acceptance of the view, and his evidence has been questioned by Acree and Hinkins. Lactic acid may play a part in erosion, but I do not think it plays the most important." Let me again state that I have never under any circumstances "put forth the idea that erosion in general is due to lactic acid." Indeed, I have been at much pains on several occasions to explain that I did not hold to such a view. I have endeavored to make it clear, especially to Drs. Acree, Hinkins and Cook, that I did not hold such a view, nor had I promulgated such an idea. I quite agree with what Dr. Cook states, that "the experimental evidence is not sufficient to warrant general acceptance of the view." I never said that it was, because I do not believe it is. On the contrary, my view is that erosion in general is not caused by lactic acid.

I merely call attention to this matter once more because it does seem to me that after repeated explanations upon this point by me, it is unwarrantable for the gentlemen interested in this subject to continue to attribute to me views which I do not hold, and then proceed to cast discredit thereon.

If there is any method, Mr. Editor, by which I can so state this question that it will prevent further repetitions of this misquotation of my views on the subject, you will place me under considerable obligation by suggesting how it may be done.

Very truly yours, EDWARD C. KIRK.

PASADENA, CAL., April 9, 1906.

My Dear Editor:

Once more "the spirit moves" me to write you a few lines for publication, if so be, you may find them room. I took two hours "off" this week to read with much enjoyment the April number of THE DENTAL REVIEW. Truly, I am compelled to believe still what I started in believing when I was a citizen of Illinois—that Chicago does lead the world in relation to progressive dentistry. I hope I may say this without exciting the least feeling of resentment or jealousy on the part of Los Angeles, Philadelphia or New York.

How I long to be at one or more of your big meetings, but it is a "far cry," and they are apt to come during my very busiest season. But I'm hoping to get there some day, spite of distance, work and weather.

But there are a few things in the April number that seem to me in need of challenge, if not correction.

First, I am loath to question a statement of fact from my good friend, Dr. Arthur Black; he has done such splendid work, and is so fine "a chip of the old block"; but I am sure he has gone astray in saying that, "It is not correct to say that an abscess has a fistulous opening." It is true, as he says, that an opening which carries a normal secretion is a fistula, but I think it is not true that an opening carrying an abnormal secretion must be called a sinus and not a fistula. Now it may be that such a distinction may come to be made in time or that it would be better, but it is not so now, based on our best authorities as well as popular usage.

The Century dictionary defines the word fistula (Pathological) as follows: "A narrow passage or duct, formed by disease or injury, leading from an abscess to a free surface, or furnishing an abnormal means of egress from some normal cavity, as in vesicovaginal fistula."

A fistula may be cutaneous or deep-seated; *incomplete* or blind, when it has but one opening; complete when there are two. Pliny speaks of "fistulas which creep inwardly and hollow as they go."

Sinus-pathol—"a narrow passage leading to an abscess or other diseased locality—a fistula."

Again, from the American Medical dictionary (Saunders Pub.), "*Fistula*—a deep sinuous ulcer, often leading to an internal hollow organ." "Fistulous—pertaining to or of the nature of a fistula" ("a deep sinuous ulcer" must carry pus). Again, "*Sinus*—a recess, cavity or hollow space." A half page of anatomical notes follow, but no reference to the word as a pathological term.

Standard dictionary—*fistula-pathol.*—1. "Any abnormal opening into a natural canal or hollow organ. 2. A long narrow canal caused by diseased action and not disposed to heal because of morbid conditions." "*Sinus*—a recess formed by bending or folding—an opening or cavity." Anat. surg. (same as fistula)—also term in botany.

As a matter of fact, the word fistula in its application to the animal body is strictly pathological and that only. Sinus on the other hand is primarily a term of anatomy, applying, as a rule, not to tubular or pipe-like channels, but to certain gaps or spaces of irregular form and some width, in cerebral, bony or other tissues.

At first no doubt the adoption of the term sinus by pathology was to describe some similar shaped space or opening. Now, however, according to the authority above quoted, the terms have come to be practically synonymous as applied to any sinuous, diseased abnormally formed channel.

I am sure that we are safe for some time yet, in the use of fistula as applied to any direct or indirect pipe-line that carries either normal or abnormal fluid, refined oil or crude (Fistulæ-Rockafelleri).

Second, the criticisms that have been published in this and previous numbers on peroxide of hydrogen amount almost to its condemnation as a practical agent in connection with dentistry.

I wish to enter my protest to these extreme views—it is an exceedingly valuable agent, and I know of nothing that could take its place for certain purposes. All that is needed, it seems to me, is a little word of caution as to its forcible injection into any sac or cavity with insufficient vent. For example, if there is doubt as to the connection between the root canal of a tooth and an apparent sinus or fistula, the fact of such connection should be established by the injection first of simple warm water, or water containing but a small per cent of the $H_2 O_2$. A very small amount of the oxygen set free will show demonstrative bubbles sufficiently to establish the diagnosis. When the fact of a free channel has been established the ordinary peroxide can be used with impunity and any small syringe, and without possibility of the calamatous consequences we have had depicted.

As to the treatment of the "blind" abscess I should like to say amen to what was said by Dr. Arthur Black, as to the surgical necessity in many cases of making an opening through the alveolar wall to the end of the root. One might as well try to clean a room by sticking a broom through the transom of a door, as to cure the cases he describes by medication through the hair-sized and often indeterminate root canal.

Dr. Johnson's statement that he had not put a barbed broach in the canal of a tooth for ten or fifteen years surprised me. I wish he had told us what he uses as a substitute. I have tried every sort, I believe, that was ever invented—hook, twist and screw broaches, and the combination of gimlet and fine barbs. And I have tried all makes of barbed broaches, and at last gone back to the Donaldson barbed and smooth, for every day and all the time dependableness.

Truly yours, GARRETT NEWKIRK.

PRACTICAL HINTS DEPARTMENT.

EDITED BY G. W. JOHNSON, D. D. S.

[This department is for busy readers. We want short articles containing practical ideas—the shorter the better. No article must exceed 200 words, unless of exceptional merit. Every dentist has some useful hint that has been of value to him, and if he will only put it in print it may be of equal value to others. That is what this department is for. Due credit will be given for every article sent. Address G. W. Johnson, THE DENTAL REVIEW, 55 State street, Chicago, Ill.]

Burs:—I can not get along without round burs. I finish the cavity preparation with square-ended burs, fissure and inverted cones; but the major part of the cutting I do with round burs, principally because I can do it with a great deal less discomfort to the patient.—*G. W. Dittmar, Chicago.*

Filling Children's Teeth:—I find that it is better to postpone attempting permanent operations even when small cavities are to be dealt with in children's teeth. I find that with the erupting first molars it is very much better not to attempt to make gold fillings, but to wait until three or four years later.—*J. W. Wassall, Chicago.*

To Keep Your Flasks Clean:—Place a small quantity of sodium bicarbonate in the vulcanizer before using and you will be surprised how clean you can keep your flasks. They are readily and easily cleaned after such use. A pair of flask tongs will aid in keeping the hands clean, and one can handle the hot flasks to better advantage.—*H. E. Davis, St. Joseph, Ill.*

Inlays for Large Cavities in Posterior Teeth:—There comes to every one of us a class of cavities that we do not know what to do with. The teeth are not bad enough to crown and it is undesirable to crown them. If you fill the cavity with amalgam you only postpone the crowning. In this class of cases Roach's Opaque Porcelain is most especially indicated.—*E. J. Perry, Chicago.*

Ethics:—I don't think we need any special system of ethics for dentists. We do need, however, more education and training, owing to the fact that the moral faculty is not innate and, therefore, subject to the improvements we really desire. The more one knows the less he goes astray; the more informed men are the more they agree together. We must take heed and not allow these hustling, selfish, modern, commercial attributes to stain our profession any further.—*Alfred Owre, Minneapolis, Minn.*

To Insure an Even Mixing of Colors:—Suppose you wish to use one part of A and four of B. Place upon the slab the amount that will be ample for the crown or inlay without addition. Mix the minor quantity first thoroughly in the water, also a fully sufficient quantity. Then when the major color is mixed therewith, the minor color is certain to be evenly distributed through the mass, the excess of water being removed, of course, with white blotting-paper.—*Garrett Newkirk, Pasadena, Cal.*

To Etch the Surface of a Gold Inlay:—I have discovered a quick method to roughen the surface of a gold inlay without distorting it in any way. After the inlay has been completed and ready to set, dip the part you want cement to adhere to in mercury. Be sure that the surface is evenly coated. This may be accomplished by taking a pellet of moist cotton with a pair of pliers and spreading the mercury around. Then invert over an alcohol flame and slowly drive off the mercury, leaving a rough crystalline surface, which the cement will adhere to.—*C. J. Hadley, Chicago.*

Filling Root Canals:—Having root ready for filling, and for the most cases having the rubber dam in place—securing a good view and dryness—I use the oxide of zinc or the powder of ox-para and trikresol, adding carbonized cotton to thicken the paste, when using it for the back teeth, thus making the mixture more readily carried to place, not, however, without a good degree of patience and considerable perseverance, the sense of touch and judgment telling when to cease pumping, and after this, if desired, a gutta percha cone finishes the filling.—*Grafton Munroe, Springfield, Ill.*

Cleanliness in the Operating Room:—If we make any effort at cleanliness at all, it should be in our operating room, and here is where we should make the most determined and conscientious effort. The floor should be covered with linoleum or should be of hard wood, with a rubber rug for the operator. I am not in favor of a carpet for this part of the office. Linoleum does not retain dirt and can be easily cleaned. The operating chair should be covered with leather and if not, it should have a napkin on the head rest and a towel across the back. Everything pertaining to dentistry should be clean, for cleanliness should be the basis of all dental operations.—*T. H. Daly, Mount Carmel, Ill.*

Treatment of Burrowing Decay:—In the treatment of burrowing decay, the positions of the cavity walls may be determined by the strength of the tissue rather than the continuance of surface attack. The general rule is briefly stated—the enamel must be cut back until supported upon sound dentine. But in addition to this very brief but very inclusive rule, there are a few areas of weakness that must be remembered in the preparation of such cavities. When the decay approaches developmental lines these must be cut out; this is of special importance when burrowing decay from proximal contact undermines the labial and lingual enamel plates close to the proximo-occlusal angles.—*Frederick B. Noyes, Chicago.*

An Effective Ligature:—In cases where the clamp is objectionable for the retention of the rubber dam, and where the ordinary floss is not sufficiently bulky to prevent the rubber from drawing over it, a most admirable method of using the ligature is to first pass the floss through two pieces of rubber tubing, allowing one piece on the buccal and one on the lingual side of the tooth. This is much preferable to stringing beads on the ligature or using other agents as already suggested. The tubing should be the smallest size sold at the rubber stores, the kind used for slipping over the bows of glasses where they rest on the ears. To insure against leakage, drop a little sandarac varnish between the tubing and the enamel on buccal and lingual sides.—*E. M. S. Fernandez, Chicago.*

Copper for Matrices:—Obtain a matrix in ordinary manner, using thin copper plate. For small cavities, fuse matrix nearly full of 18-K. gold solder by holding in flame of the alcohol lamp. Replace in cavity and burnish well to cavity margins; remove and add solder until flush with margins. For large inlays, it is necessary to invest. Place a *fold of small copper wire in bottom of matrix,* and run up with gold solder, using plenty of flux; grind nearly complete before setting and, last of all, drop the inlay into nitric acid to remove the copper. The copper wire having been removed by the acid leaves a good retaining groove. Do not grind after removing from the acid until after inlay is set, as there would be danger of injuring the sharp marginal edges. These edges should be carefully burnished to the tooth while cement is soft. There are advantages in this method more patent than simply the price of the material.—*V. B. Newell, Chicago.*

Making the Cap and Pin (Base of the Porcelain Crown) Easily Removable:—Having taken the impression and bite with the modeling compound in the usual manner to show the relation of the occluding teeth, with a small spatula fill the cap smoothly and evenly with either plaster or modeling compound. Soap or oil the surface of this together with the whole impression—both sides. This leaves the pin protruding for the guide. Now take a piece of German silver hollow joint-wire (such as may be obtained at any jeweler's supply house, in various sizes), one that just nicely fits over the pin, and of the same length, slip it over the pin for the impression; pour both sides of the impression attaching to the articulator in the usual manner. When plaster is thoroughly set, remove the modeling compound under dry heat. The base of the crown is then at once separable from the model, the tube insuring accuracy of position in building up the crown. I would like here to emphasize one or two points in connection with the use of modeling compound. First, the necessity of thorough chilling with cold water before removal from the mouth. Second, the use of dry heat instead of hot water always for removal from an investment.—*Garrett Newkirk, Pasadena, Cal.*

Amalgam Inlays:—They are all good. The principle upon which they are inserted is good. I insert both gold and porcelain inlays, and there are times when amalgam is indicated, as Dr. Ottolengui says, "not for cheapness, but because it ought to be used in some particular cases." Amalgam can be inserted on the inlay method which will be found extremely useful where it is difficult to give the cavity a retentive form on account of undue loss of tooth substance and where in order to obtain anchorage, the pulp would be encroached upon, or the tooth weakened. After preparing the cavity and thoroughly drying it, I prepare the amalgam. I now mix some cement (slow-setting preferred) and smear over floor and walls of cavity, not very deep. Then a piece of amalgam is placed in position and carefully but quickly pressed into place. If the amalgam has been squeezed pretty dry previous to use it will press out excess cement, which should be wiped off. More amalgam is added until desired contour is obtained, when filling is finished in the usual way. These fillings are held as firmly as are inlays—by a thin film of cement which serves the purpose of mechanical retention, preventing recurrence of decay and a non-conducting lining, which *tends* to prevent thermal shock.—*W. H. Reaben, McComb, Miss.*

MEMORANDA.

WEST VIRGINIA BOARD.

This board is succeeding in securing convictions against illegal practitioners in the State and the members promise to keep up the crusade till none but legally qualified men are practicing. The next meeting of the board will be at Charleston, June 6.

ANTIPHLOGISTINE AT SAN FRANCISCO.

Within the week of the disaster there were 100,000 pounds of Antiphlogistine shipped to the coast on order, and the emergency hospitals were liberally supplied free of charge. This may give some idea of the extent of the personal injuries, aside from the immediate deaths.

NATIONAL ASSOCIATION OF DENTAL FACULTIES MEETING.

The annual meeting of the National Association of Dental Faculties will be held at Atlanta, Ga., commencing at 2 p. m. Friday, September 14, 1906. The executive committee will meet at 10 a. m. on the same day.

H. B. Tileston, Chairman Ex. Com.; R. M. Sanger, Secretary Ex. Com., East Orange, N. J.

E. K. WEDELSTAEDT CLUB OF IOWA.

The E. K. Wedelstaedt Club of Iowa and the G. V. Black Club (Inc.) of St. Paul, Minnesota, will hold a joint clinic in Clear Lake, Iowa, on June 25-26, 1906.

A cordial invitation is extended to all reputable practitioners.

There will be reduced railroad rates on all roads to this summer resort.

For further information address William Finn, secretary, room 28 Kimball building, Cedar Rapids, Iowa.

WISCONSIN STATE DENTAL SOCIETY.

The thirty-sixth annual meeting of the Wisconsin State Dental Society will be held at Madison, Wis., July 17, 18 and 19, 1906. The program committee is arranging an unusually interesting program. Some of the most eminent men in the profession will be with us and all indications point to one of the best meetings ever held in Wisconsin. All ethical dentists are most cordially invited to attend.

W. H. Mueller, Secretary.
21 West Main Street, Madison, Wis.

MINNESOTA STATE BOARD OF DENTAL EXAMINERS.

The Minnesota State Board of Dental Examiners will hold a special meeting on June 14, 15 and 16 at the dental department of the State University in Minneapolis, Minn., for the purpose of examining those who desire a license in Minnesota.

All applications must be in by noon of June 14. For further information address Dr. Geo. S. Todd, Secretary.
Lake City, Minn.

INTERSTATE DENTAL FRATERNITY.

The annual meeting of the Interstate Dental Fraternity will be held at the New Kimball House, Atlanta, Ga., on Monday, September 17, 1906.

The meeting and banquet will be in charge of Dr. Frank Holland, the Vice-President for Georgia. Dr. Holland's well established reputation as a host is a sufficient guarantee for a royal good time for all the fraternity who can arrange to get there. Do not miss it.

R. M. Sanger, National Secretary.

SOUTH DAKOTA STATE BOARD OF DENTAL EXAMINERS.

The next meeting of the South Dakota State Board of Dental Examiners will be held at Sioux Falls, S. D., beginning July 31, at 1:30 p. m., and continuing through the days of August 1 and 2. All persons wishing to take the examination must send in the examination fee of $10 before July 24. Candidates must bring operating instruments, including dental engine, and such other appliances and materials as are necessary to do crown and bridge work. G. W. Collins.

Vermillion, S. D., May 9, 1906.

WISCONSIN STATE BOARD OF DENTAL EXAMINERS.

The next meeting of the Wisconsin State Board of Dental Examiners for examination of candidates for license to practice dentistry in Wisconsin will be held in Milwaukee, June 18, 1906, at the Wisconsin College of Physicians & Surgeons, Milwaukee.

Application must be made to the secretary fifteen days before examination. The candidate must be a graduate of a reputable dental college, or have been engaged in the reputable practice of dentistry for four consecutive years, or an apprentice to a reputable dentist for five years.

For further particulars apply to J. J. Wright, secretary, 1218 Wells building, Milwaukee, Wis.

IOWA STATE BOARD OF DENTAL EXAMINERS.

The Iowa State Board of Dental Examiners will hold its next meeting at Iowa City beginning at 9 a. m. Thursday, June 14th. Practical examination will be held in operative dentistry and written examination in the following branches: Anatomy, Physiology, Chemistry, Metallurgy, Oral Surgery, Materia Medica, Pathology, and Therapeutics, Histology, Hygiene, Orthodontia, Dental Jurisprudence, Bacteriology, Operative and Prosthetic Dentistry.

All applications for examination must be filed with the secretary by June 5th.

For application blanks and further information apply to

E. D. Brower, Sec., Le Mars, Iowa.

RECIPROCITY IN IOWA.

The following amendment to the dental law of Iowa has been passed by the Thirty-first General Assembly:

Be it Enacted by the General Assembly of the State of Iowa:

SECTION 1. The Board of Dental Examiners may, without examination, issue license to practice to any dentist who shall have been in legal practice in some other State or territory for a period of at least five years, upon the certificate of the Board of Dental Examiners or a like board of the State or territory in which such dentist was a practitioner; certifying his competency and that he is of good moral character and upon payment of Twenty-five Dollars ($25.00). Provided, however, that the State from which any practitioner may come shall have, and maintain equal standards of laws regulating the practice of dentistry and recognize exchange certificates issued by the Board of Dental Examiners of the State of Iowa.

PATENTS OF INTEREST TO DENTISTS RECENTLY GRANTED.

815,907. Dental expander or dilator, Cleveland G. Davis, Manistee, Mich.

815,807. Dental plate swage, Grant E. Freeborn, Belfast, N. Y.

815,534. Toothpick and forming same, Henry S. Hopper, Norfolk, Va.

815,374. Tooth mold, Evelyn Pierrepont, London, England.

816,069. Dental tool holder or clutch, Benoni S. Brown, Onset, Mass.

816,481. Cap and brush for bottles, Johnson Lane, Jamestown, Cal.

817,050. Dental floss holder, Joseph C. De La Cour, Conshohocken, Pa.

12,470. Reissue, Manufacture of acid-proof cement, Richard Liebold, Weimar, Germany.

816,668. Dental instrument for raising barbs upon wires, Lloyd S. Lourie, Chicago, Ill.

816,685. Shield and moistener for dental tools, Charles A. Sevier, Jackson, Tenn.

816,828. Dental contour pliers, Nathan H. Smith, Seattle, Wash.

817,978. Toothpick, Albert E. Lickman, Baltimore, Md.

818,000. Tooth-brush, Charles R. Stevenson, Boston, Mass.

Copies of above patents may be obtained for ten cents each by addressing John A. Saul, Solicitor of Patents, Fendall building, Washington, D. C.

SUPREME COURT DECISION ON THE NEW DENTAL LAW.

The Illinois Supreme Court, on April 17, handed down a unanimous decision sustaining the constitutionality of the Clark Dental Act of Illinois, in force on July 1, 1905.

It was rendered in an appeal from the County Court of Will County in the case of the People of the State of Illinois vs. Charles H. Kettles, who was convicted of the illegal practice of dentistry. The information in the case charged him with unlawfully practicing dentistry on the 1st day of October, 1905. The proof showed that he performed dental work in August and September, 1905, and it was urged that this difference in dates was fatal, and that the lower court should have instructed the jury to find the defendant not guilty.

The Supreme Court rules: "When the time of the commission of the offense is not of the essence, it need not be precisely laid. . . . Proof that the offense was committed on any day within the period of limitation and before the information was filed, was sufficient. . . ."

The court further ruled that where "one is accused of practicing dentistry illegally, without a license, and this fact lies within the knowledge of the defendant, the accusation, unless disproved by the defendant, will be taken as true."

It was insisted that the Act of July, 1905, is contrary to Secs. 1 and 2 of Art. II of the Constitution of the State of Illinois; and Sec. 22 of Art. IV of the Amendment of the Constitution of the United States. The Court says "that legislation prescribing regulations for securing the admission of qualified persons to professions and callings demanding special skill, is within the valid exercise of the police power of the State" is not a mooted question, and "that the practice of dental surgery requires special skill and training. will not be denied by anyone."

"The requirement of the statute that an applicant to take the State dental examination, shall produce a diploma from some dental college, school or dental department of a reputable university, or shall be a graduate of and have a diploma from some reputable medical college with the exception in favor of all applicants who have been engaged in the actual, legal and lawful practice of dentistry or dental surgery in some other state or county for five consecutive years just prior to application,' does not render the act obnoxious to the objection that it violates Sec. 22 of Art. IV of the Constitution. The legislature had the power to prescribe what qualifications would be required of those desiring to practice dentistry in this State and in what manner those qualifications should be determined."

The provision allowing persons who have been engaged in the legal practice of dentistry for five consecutive years in another State or county to become applicants for permission to practice in this State is only a qualification prescribed by the legislature as a prerequisite to practice in this State, and one which they regarded as sufficient and no doubt equivalent to the qualifications placed on the other applicants of producing a diploma of some reputable dental school or college.

Sec. IV of the dental law of 1905 was assailed on the ground that it confers on the State Board of Dental Examiners the unlimited right to determine the reputability of dental schools from which a diploma will be accepted; that it grants them arbitrary powers and that the board may establish unreasonable rules and regulations.

The Supreme Court says "this section confers on the Board of Examiners the right to make such reasonable rules and regulations as in their judgment and discretion are deemed necessary, and a like discretion to determine what is a reputable dental college or school by reference to the standard of educational requirements, adopted by the Board. No arbitrary powers are granted. The enactment requires the rules to be reasonable. Whether the rules and regulations of the Dental Board are uniform and reasonable and in accordance with the law, is a question the court will decide when that question is presented to them. We can not presume that the powers granted by said Sec. 4 will be abused or the law disobeyed. If the discretionary powers granted by said Sec. IV are exercised, unreasonably or with manifest injustice, as the plaintiff in error contends they will be, the person aggrieved has recourse to the courts."

The provision in Sec. V of the Dental Act which permits legally licensed physicians or surgeons to extract teeth, and students in dental schools to perform dental operations under the supervision of competent instructors within such school was also assailed. The Supreme Court says with reference to the physicians, "The reason for the exception is obvious, and that it is not class legislation is too clear to require serious consideration." And, with reference to the dental students says: "The purpose of this provision of the law is apparent. It is to permit only actual bona fide students the benefit of practical work under an instructor, but to prevent evasions of the law by persons practicing the profession under the pretense of being students. The Act very properly provides who shall be students within the clause allowing them to perform operations or parts of operations. It is open to every student to bring himself within the definition."

With reference to Sec. 7 of the Act of 1905, which refers to the revocation of licenses, the Supreme Court says that the defendant in the case has no grievance in this respect. He has not had any certificate revoked; has never received a certificate or been licensed to practice, and, if in this particular, the Act could be regarded as unconstitutional, we would not hold the entire act for that reason to be void or to be so, in so far as it bears upon this case.

It was also claimed that under Sec. 11 of the Act of 1905 the County Court had no power to commit the plaintiff in error to jail, there to remain until the fine and costs are fully paid.

The Supreme Court says . . . "and that all fines imposed and collected under the Act shall be paid to the Illinois State Board of Dental Examiners for its use." Sec. 14, Div. 14 of the Criminal Code is as follows: "When a fine is inflicted, the Court may order as a part of the judgment, that the offender be committed to jail, there to remain until fine and costs are lawfully paid over, and he is discharged according to law.

"This is a general statutory provision and applies to the convictions under the statute hereunder consideration."

"Judgment must be and is affirmed."

"SCRAP PILE" FOR SAN FRANCISCO SUFFERERS.

Editor Dental Review: Undeh the heading of the "Scrap Pile" I desire to make a suggestion regarding a fund for San Francisco sufferers. From my experience during the past few weeks, the task of acquiring a sum sufficiently large to materially assist those in need is a difficult one, and the "Scrap Pile" idea envolved from the ease with which a goodly sum was collected in Kansas City a year ago for an event of minor importance by simply requesting all asked to donate a portion of their gold scraps. Several hundred pennyweight soon accumulated.

Now let every dentist, regardless of the fact whether or no he has paid into other funds, box up a portion of his gold scraps and send them to any dental journal, or to Dr. J. D. Patterson of Kansas City, Mo., treasurer of National Relief Committee, Keith & Perry building, and further assist those in distress. Yours, J. P. Root.

THE

DENTAL REVIEW.

VOL. XX. CHICAGO, JULY, 1906. No. 7.

THE USE OF THE X-RAY IN DENTISTRY.*

BY HARRY LOVELL LEWIS, M. D., CHICAGO, ILL.
PROFESSOR OF RADIOGRAPHY AND PHOTO-CHEMISTRY, ILLINOIS SCHOOL
OF ELECTRO-THERAPEUTICS.

The purpose of this paper will be, not so much to present something new as to call your attention to the value and wide scope of the x-ray in the practice of dentistry.

A great number of the dental profession do not seem to fully appreciate the usefulness of this much neglected means of diagnosis, and do not realize that it is of inestimable value in the everyday work of the dentist as well as in his irregular cases.

The question is often asked by outside dentists, "why the dental profession of Chicago has been so slow to take up the x-ray as a means of diagnosis in masked conditions of the teeth?"

In ordinary practice the dentist has much more use for the x-ray than the general practitioner or the surgeon, and as soon as he realizes the great help the skiagraph may be in his everyday work there will be need no longer to ask why he does not avail himself of the x-ray.

One of the principal reasons why the dentist is not using the x-ray as much as he should, I believe, lies with the skiagrapher. Most of the work along this line in Chicago has been turned over to the physician and skiagrapher, who from his lack of dental training fails to appreciate fully what is required, and in attempting to show too much or in getting too many teeth in the field at one time, destroys the fine detail and accuracy that is more essential in dental skiagraphs than in any other.

Much of the work has been inaccurate and misleading, showing distortion and elongation of the roots, and often giving a wrong impression of the relation of the tooth to the surrounding bony structure. This has been disappointing to the dentist and has often discouraged further efforts to secure good skiagraphs. You may ask why the x-ray laboratory has not been producing more satisfactory dental skiagraphs.

---

* Read before the Odontological Society of Chicago.

There are several reasons.

The limited space in the mouth in which to place the sensitive film, the variation of the arch of the hard palate which limits the distance up along the roots of the teeth and varies the angle at which the film can possibly be placed, makes the proper taking of a skiagraph of the teeth anything but uniform and easy.

Unerupted cuspid teeth.

In all skiagraph work the placing of the Crookes tube so that the direct rays thrown off from the anode will strike the sensitive film at a right angle to its surface and not slantingly is of vital importance.

The film must be placed as nearly as possible at a uniform distance from all parts of the tooth.

These two items cause more trouble than all others and are the cause for elongated and otherwise distorted images of the teeth.

The dentist requires greater accuracy and detail in a skiagraph than the surgeon, and detail in a skiagraph calls for much practice in adjusting the tube vacuum properly to secure the exact penetration necessary in each case. Most of the specialists of orthodontia have been using the x-ray liberally for several years and it has been in irregular and delayed dentition and impacted teeth that the value of the skiagraph was first recognized by the dentist.

The advantage of preventing deformity of the teeth by being able to anticipate accurately what is going on in the jaw and of correcting it with the least amount of effort is of great importance, but to be able to determine the location of an abscess and to tell its cause, and to determine whether or not the roots of a tooth are properly filled opens up a wide field of equal importance to the dentist and his patient.

In cases of pericemental inflammation and abscess where the history is uncertain, the ideal procedure is to first skiagraph the condition and locate the extent and cause of the lesion.

With this information, which is definite and accurate, the dentist can get directly at the seat of trouble with the least amount of delay and effort.

Root canal fillings have very aptly been called the "dentist's graveyard." With the skiagraph so accessible the dentist has no excuse for doing defective work, trusting that it will never cause trouble; sooner or later defective work in root fillings may cause trouble and the dentist getting hold of the case should have the tooth skiagraphed to protect himself and to substantiate his statements, as well as to give a definite knowledge of the condition that will enable him to save the tooth.

I believe a large percentage of the teeth that are now diagnosed as incurable might be saved could the dentist positively see what is going on at the apex of the root and in the surrounding bony structures.

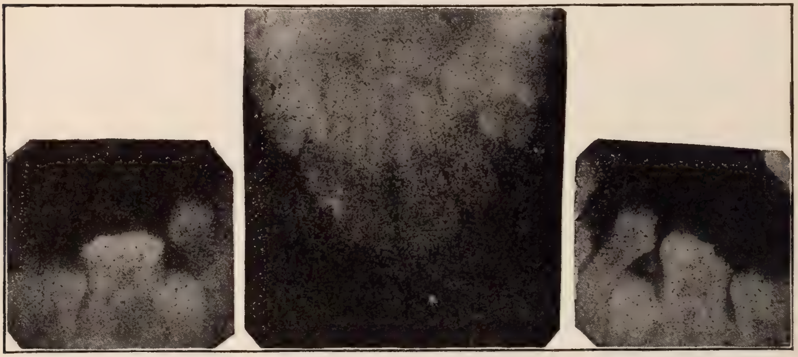
I am told that it is often impossible to properly fill a crooked root canal. After looking at some of the distorted teeth I have skiagraphed I do not wonder that it is difficult, though how much less trouble the dentist would have in filling these root canals if he had an accurate skiagraph showing the shape and direction of the root.

In fully 90 per cent of the cases of abscess that I have skiagraphed, improper and short root fillings have been apparently the direct cause, and the skiagraph has shown the apex of the root to be unfilled.

Not all the partly filled root canals have been accompanied by abscess, but who can tell when they will be the cause of trouble? When skiagraphy becomes generally used in dentistry there will be much better work done in filling root canals and the dentist will no longer have to work in the dark or by guess.

I am a physician and am free to confess that I know nothing about dentistry except what the x-ray has suggested to me in my efforts to help the dentist.

I am not handicapped by prejudice, nor am I familiar with the controversies, if there are such, in regard to the way to fill roots or the way not to fill roots, but I have observed that there is a way of filling them that gives me an opportunity frequently to skiagraph an abscess at the apex of the root.



Right lower. Upper. Left Lower.
Fig. 3. A group of five impacted teeth in one case.

There are many causes of abscess, no doubt, and I may be wrong in laying so many of them to root fillings, but as I have said 90 per cent of the cases of abscess that I have skiagraphed have persistently accompanied teeth in which the root fillings were short.

I have held a post mortem on a number of teeth, that I borrowed from a convenient graveyard for teeth, an extraction specialist's back room, and have skiagraphed them. I do not know that any of these teeth have been abscessed, but the fact that they are out is evidence that they had worn out the patience of their owner if not his dentist.

I will pass these negatives around. On their face they show the trouble. One of these negatives shows a tooth with an immense filling, some of the roots filled, others partly filled; another shows a molar ground down to the gum line with a large filling and three roots filled to their apices by some dentist who spared no pains, and by the appearance of the wear on the crown it served its purpose for years and succumbed to old age.

In the collection are teeth with no fillings, teeth with dead pulps, teeth with partial root fillings and teeth with fillings that go to the apex of the root.

One tooth with a broach broken off through the side of the root where some dentist tried to make a root canal, probably thinking the broach filled the canal completely, he left the real root canal entirely unfilled. Had he been enlightened with a skiagraph he would not have made this mistake or he would have attempted to correct it before filling the tooth.

In one of the teeth the root bends on itself with a clubfoot appearance. I don't know how the dentist could fill a root like that, but no doubt it could be done more easily with the aid of the x-ray than without.

Around and back of some of the large fillings can be seen the process of decay which has continued after the tooth was filled. Had these skiagraphs been taken before extraction the dentist could have seen what fillings were causing trouble and how easily they could be removed and the trouble corrected. Some of these fillings did not look defective and were firm in the tooth. To determine whether or not chlora-percha root fillings will show at the apex of the root, I have taken a skiagraph of a tooth filled for me by one of your number. You will have no difficulty in seeing the fillings, and even with the tooth in the mouth very small and fine fillings will show distinctly with a high vacuum tube.

The dentist has a great advantage over the physician in that by the means of the x-ray he can hold as good a post-mortem examination before extraction of the tooth as after, and he can profit by the knowledge so gained.

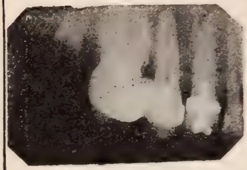
The skiagraph speaks for itself. The more it is studied the more there is to be learned from it.

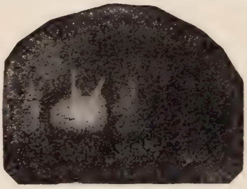
If properly taken it is accurate and practical.

The range of application of the x-ray to dentistry is very broad, it has probably been of greatest service and most frequently resorted to in unerupted teeth, where there is often no visible sign of such a tooth, and it is supposed not to be formed. Wandering teeth are easily studied and the information gained where teeth are altogether missing is often of equal importance.

The process of development of unerupted teeth may be accurately and easily studied, watched and regulated with the least possible amount of work and the greatest possible success.

Impacted third molars, especially the lower, are easily skiagraphed, showing not only the size, shape and development, but suggesting how best and most easily to get at it, as well as showing the amount of absorption of the roots of the tooth that binds it down.





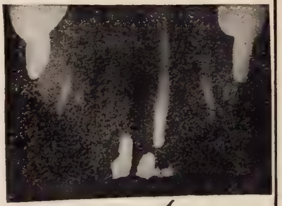


Fig. 4. Abscess at root of apex of bicuspid, broken root of 2d molar in jaw.
Fig. 5. Abscess involving roots of first molar.
Fig. 6. Pyorrhea pocket about central incisor.

Broken fragments of bone, fractured roots of teeth left in the jaw, broken drills and broaches in the root canal, and pulp nodules are at times found as a surprise and their discovery is usually of value in clearing up the cause for neuralgia.

Skiagraphs in these conditions are especially interesting and satisfactory to the patient as well as to the dentist.

Tumors of the jaw containing teeth, exostoses, deposits on the roots, pyorrhœa pockets, diseased and absorbed roots and diseases of the antrum are conditions in which the x-ray is the most valuable means of diagnosis at our command.

If I make a mistake in the use of names, or do not give the most elegant pronunciation of some of your terms, charge it up to my ignorance of dental nomenclature rather than to skiagraphy.

In amputation of the apex of the root, and in drilling through root canals too small to be found otherwise the skiagraph may be made of great service.

In no class of cases is the x-ray of more service than in locating an abscess.

It is not easy by any other method to get so concise and accurate knowledge of the location, extent, and cause of an abscess, the direction and path of the fistula or the most dependent point of the pus cavity through which it should be drained; "often not the root canal," as the skiagraph offers.

X-ray work does not necessarily require much time for the exposure and the negative may be developed in a few minutes, sufficiently for the skiagrapher to see whether or not he has succeeded in getting what he is looking for. However, to get the film in shape where it may be handled and examined properly requires some time.

The exposure after everything is ready requires from five to thirty seconds, according to the action of the tube, the development of the negative takes from five to ten minutes, the fixing bath another ten minutes, and then comes the washing, which requires a half hour. After this the film must dry thorough, which consumes another half hour at least. A more rapid print may be made on bromide paper and developed up in a few minutes, but it lacks detail and is only good to find out if the film will show what is wanted.

It looks easy to take a skiagraph and it sounds very simple and easy to say wrap a positive film in black paper or black dental rubber, place it in the mouth back of the teeth to be skiagraphed, turn on the current a few seconds, take out the film and develop it—all done in a few minutes' time. I have heard the process described by a dentist who has tried it, and it is this easy, slip-shod method of taking skiagraphs that leads to failure and puts the x-ray in disrepute among the dentists as well as the surgeons.

It is almost as reasonable to expect any man with a camera to take a good likeness and make a success as a photographer, or any painter with the same paints and canvas to produce a Turner or a Whistler as to expect the physician or dentist occasionally taking a skiagraph to bring out the best detail and accuracy. When I began taking skiagraphs I thought it was simple and easy but it seems more difficult as I realize the possibilities of the x-ray and see how much more one can get out of it by painstaking accuracy and experience. It requires more accuracy of detail, more calculation of position, more regulation of the tube and current, more knowledge of the principles of skiagraphy to take a simple skiagraph of the teeth than it does to take most any other part of the body. There are more things about the mouth to handicap the skiagrapher than one realizes off-hand, and the difficulty even with those constantly using the x-ray is to get uniformly good results.

It is impossible to work out a definite technique that may be followed in all cases; each case must be worked out separately, as it is difficult to get two cases with identical conditions and is almost impossible to judge one case accurately by another.

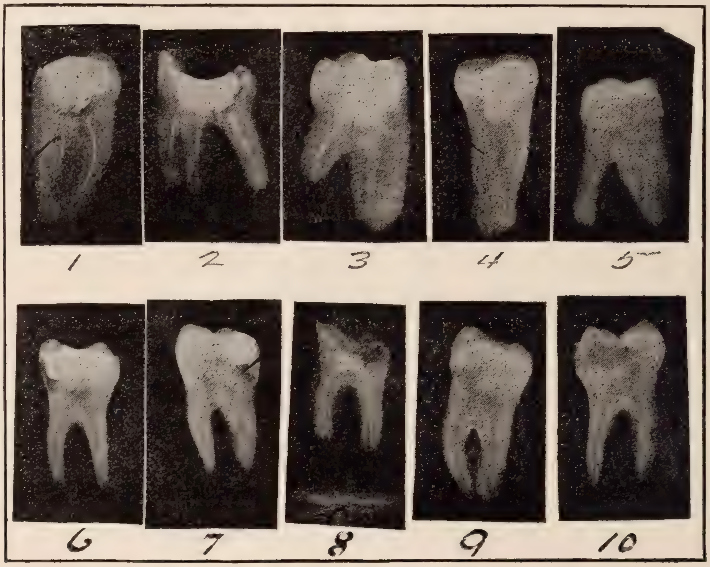


Fig. 7. 1. Broken broach in root. 2. Fillings to root apex. 3. Chlora-percha fillings. 4. Partly filled root canal. 5. Normal healthy tooth. 6 and 7. Decay around fillings. 8. Fillings extending beyond apex. 9 and 10. Diseased pulp.

It is important that the skiagrapher knows definitely what he is looking for and that he have all the assistance possible from the dentist. There is no question but that the dentist thoroughly understanding the x-ray apparatus and taking skiagraphs of his own case has the advantage, but how many dentists are equipped for this work, either in apparatus or experience?

In radiography the best results can be secured only by selecting rays that have just the penetration necessary to register the information wanted. The penetration of the rays varies according to the degree of exhaustion of the tube, according to the amount of exciting current and the adjustment of the tube to that current, and according to the density of the part skiagraphed.

In taking dental skiagraphs the minute anatomy of the teeth as well as the surrounding parts must be taken into consideration, relative to their density and specific gravity, so that the rays may be adjusted to penetrate the less dense tissues and not the more dense parts, thus showing contrast.

In taking a skiagraph of the body the difference in density of the tissues is great. The contrast being between bone and soft tissues or a foreign body and soft tissues. Unfortunately in dental skiagraphy the differences in density between the teeth and surrounding bone is small and the contrast is less marked.

The greater the density of any substance the more the rays are obstructed by it. The dentine offers more obstruction to the x-rays than bone, the enamel more than the dentine, gutta purcha root fillings more than the enamel, cement and metal fillings and broken steel instruments still more. In addition to estimating the probable degree of obstruction to the x-rays in each case and in adjusting the tube vacuum properly, the skiagrapher should know thoroughly all pathological conditions that may be present and that are to be looked for, and must be able to recognize them in the negative.

The proper development of the negative is of the greatest importance; an otherwise good negative is often ruined by developing out the registration of the less dense structures.

Proper development of skiagraphs can only be done by the party taking the negative or knowing just what information is wanted, and the greatest detail can be brought out only by slow development.

If the x-ray was of value only as a means of diagnosis it would fill the field more thoroughly and honorably than any other one method at our command, but it is of even greater value in the treatment of diseases that have proven almost intractable to other measures. By it many cases of pyorrhea, excementosis, neuralgia, lupus, rodent ulcer about the mouth and cancer have been much benefited and often cured, but we will not attempt to touch this aspect of the x-ray. It is too broad and of too much importance to be passed over lightly.

The question naturally arises in your mind, what are the dangers of the x-ray? What about x-ray burns?

The short exposure, together with the high vacuum of the tube used in skiagraphy of the teeth, precludes all danger of injury or burn for the patient, where the exposure is properly made by one thoroughly understanding the work.

The risk to the skiagrapher from repeated exposure to the x-ray is greater in dental work than in any other on account of the necessity of holding the film firmly in the mouth, which brings him directly in the field of the rays.

PRESIDENT'S ADDRESS.*

BY T. A. HARDGROVE, D. D. S., FOND DU LAC, WIS.

Ladies and Gentlemen, Members of the Fox River Dental Society:

It was my intention to allow this meeting to pass without burdening you with any remarks in the form of an address, owing to the fullness of the clinics and papers that your very active executive committee has prepared for you. But after some persuasion from the chairman, I came to the conclusion that it would be improper to allow a meeting such as this to pass without some brief remarks.

The fact is becoming apparent that we as dentists are giving too much time to the mechanical phase of our profession.

In this advancing age, when the whole field of work is changing, when laborious methods are being simplified, we must direct our efforts to the scientific part of our profession for achievements.

We should do more research work, if not individually, work in committees, and I would suggest for this society such a plan. Establish research or investigating committees to work on some given topic for a certain period, and at the end of that time bring the report back to the society. I would, wherever convenient, work with other societies. Let a committee be made up of some members from this society, the balance from some other, and when the time allotted to them for the completion of their work arrives, the members of each society could bring their report to their respective organizations. By this method the work would be made more pleasant, and with such a united effort the entire dental world could be put to work upon a single subject, if necessary, and when you have all the dentists who belong to societies in this country working you have a mighty force, and results must come.

---

* Read before the Fox River Dental Society, Neenah, Wis., March 13, 1906.

The practice of dentistry is different from what it was ten or even five years ago—aye, one year ago. More is expected of the up-to-date practitioner. He must perform more esthetic, less fatiguing, more aseptic, more permanent operations. He must be competent to make more scientific diagnosis and render more scientific advice. To give good, scientific dental advice you must have it founded upon a scientific education.

Dr. Senn, in some recent remarks at an alumni banquet, said that American medicine and surgery found its first recognition in the world through the American dentist. This is indeed saying a good deal from such a source. But he also said that what we need here in this country is more of the scientific spirit.

There is much yet to be learned about the pathogenic bacteria of the mouth, about the sources, the nature and clinical manifestations of dental inflammatory infections, and about tumors. Plastic surgery of the mouth is yet in its infancy.

We sometimes excuse ourselves because of a lack of equipment, when in reality what we lack is a little earnest effort. Equipment can always be had at a moderate price, but desire to work we must create within ourselves. To accomplish all this we must be ethical practitioners in the fullest sense of the term. If you are not ethical, you are afraid to meet your fellow practitioners and converse heart to heart as you should, each working in a certain direction, looking to others for suggestion and ready to give that which you have that may be of benefit to others in their effort.

The public is coming to know, through the efforts of local societies, that the dental profession is an underpaid and overworked profession, and all over this country there is a tendency to give better fees for our services.

The time was when a dentist would make an amalgam filling for fifty cents. Should a dentist quote such a fee in this day to an intelligent patient he undoubtedly would lose the patient, and some more earnest practitioner who would charge $1.50 or $2 would get him.

Now that we are seeking a better public standard for our profession, the dental colleges should assist us. If I were asked to prescribe a course for a dental education I would place his requirements for matriculation at a university or a similar course, or its equivalent in the form of an examination.

Then his dental course should include all, if not more, of the studies included in the regular medical course, and when the finished product would be turned out we would have the highest type of a learned profession. As has been recently said by a man well up in the educational world, "A dentist of this type should be the most cultured, best informed, best mannered, best demeanored, the best disciplined, best principled and best dressed of any calling."

REFLEX NEUROSES.*

BY DR. W. A. ROBERTSON, CROOKSTON, MINN.

Mr. President and Gentlemen:

During health the intimate relations existing between the teeth and the other organs of the body are not recognized, but when they become the seat of pathological conditions these relations are manifested sometimes at seemingly remote parts, and it is to the consideration of some of these that I invite your attention at this time in the hope that a discussion of this subject may be of interest as well as beneficial in our daily practice.

That the teeth are often the cause of apparent organic disease in other parts of the body, as well as, that diseased conditions of other organs may by a mysterious bond of sympathy caused apparent trouble in the teeth, has been proven repeatedly by clinical observation; and while it may be beyond our power to explain the manner by which these conditions are produced, still we are forced to admit that one may have toothache in the brain, the ear, the stomach, or the hip joint, or we may have headache, gastralgia, etc., in the teeth.

In order to a clearer understanding of this subject, permit me, as briefly as possible, to refresh your minds upon the theory of nerve impulses. As you are all aware, the entire organism is under the control of the nervous system, which consists of the brain and spinal cord, together with the nerve trunks which arise from them and are known as the cerebro-spinal system, to distinguish it from the ganglionic or sympathetic system, which is found in the form of ganglia situated on each side of the vertebral column and extends from the head to the coccyx. These ganglia give numerous branches which form the plexuses, and pursue the same course as the arteries, from which they usually receive their name. In the cerebro-spinal system are situated what are known as nerve centers, the function of which is the origination, transference and reception of nerve impressions. The nerve trunks and their ultimate branches are composed of afferent or centripetal, and efferent or centrifugal fibres.

---

* Read before the North Dakota Dental Association at Fargo, N. D., January 16, 1906.

The afferent fibers are those which conduct the impression from the center to the periphery. It has not been shown that there is any structural difference between those two kinds of fibers. There are also found upon the course of some of the larger nerve trunks, ganglia, which are also centers, which, together with those of the spinal cord, are known as subordinate centers, and are controlled by higher centers in the medulla and brain proper, where the impressions terminate.

A simple reflex act, therefore, consists of an impression received at the periphery, being transmitted by the afferent fibers to the ganglia or nerve center to which it belongs, and the reflexion of the stimulation back again through the efferent fibers to the point irritated.

If for any reason the ganglion receiving these afferent impulses fails to perform its function properly, and allows these impulses to be sent to some other part, we have the irritation or pain felt there instead of at the point of irritation.

This I believe to be the generally accepted theory of the nerve impulses and is the only explanation that seems to account for the reflection of pain to other parts of the body other than that at which it is received.

While it may not be out of place at this point to review the anatomy of the fifth pair of cranial nerves, yet I feel that this paper will be quite long enough, and as you are doubtless all familiar with the origin and distribution of this important nerve, will only ask you to remember in this connection the deep orginas. Ranny says: "The intimate relations which this nerve (the fifth) bears to the points of origin of the sixth, seventh or facial eighth or pneumogastric, and the ninth or hypo-glossal cranial nerves in the floor of the fourth ventrical, possibly explains many of these phenomena which are considered as reflex in character and whose starting point seems to depend upon some irritation of the fifth nerve by means of some of its many branches."

In a study of some of these dental reflexes we will divide them under two heads—viz., those arising from lesions of the teeth themselves, and those arising from constitutional causes.

Amongst the most prominent of causes involving the teeth are: (1) Superficial caries, (2) deep-seated caries, (3) exposed pulp, (4) congested and inflamed pulp, (5) dead and putrescent pulp, (6) granules or osteo-dentine, (7) abrasion and erosion of teeth, (8) inflammation of peridental membrane, (9) eruption of third molars, (10) exostosis.

In making a diagnosis I am in the habit of following Dr. J. E. Garretson's advice, remembering the above mentioned causes and following a process of exclusion.

The most common form of reflex pain is that which the pain is referred to some other than the tooth affected, either in the same jaw or frequently to the opposite; as for example, pain which is felt in a lower tooth may be caused by an exposed pulp in the upper, and vice versa. This being the case, it is well to be very careful in making a diagnosis.

Next to the teeth themselves, the ear seems to be most frequently the seat of pain, and in many cases diseased conditions of this organ have been cured by the removal or treatment of the offending tooth. I will only refer you to a few cases, although you will find many in both medical and dental literature.

There appears to be greater degrees of sympathy between the lower teeth than those of the upper jaw and the ear, and this seems to decrease as we advance toward the front of the mouth, although an exception occurred the other day, which was caused by the second bicuspid, the pain alternating between the ear and the tooth. While it was easily removed, the patient was nearly wild with pain in the ear, which lasted for ten or fifteen minutes after it was removed. Usually, whenever upon inquiry I find pain in the ear complained of, I look at once to the condition of the lower third molar on that side. Dr. A. P. Brubaker, when referring to the route of the reflected nerve current which causes the above mentioned conditions, says: "Whatever the method or character of the process, the fact is undisputable, and dentists possessing the requisite knowledge may honor both themselves and the profession, and at the same time relieve much distress, by keeping a fact before their medical and aural conferees. It can not be doubted that much deafness is a result of unrecognized dental trouble in infancy, and as conditions of deaf-mutism is so often the sequel of ear lesions, it is highly probable that the great number of these pitiable objects in the charitable institutions might be lessened by so simple a matter as the attention of the gums of children during teething."

I am convinced that most of the earache in children is due to the irritation of the erupting teeth, and at the same time suggest the use of Antikamnia as a panacea, and also the use of the lance in cases of convulsions where it is indicated, as I believe we are justified in using it when teeth do not show at the proper time. Even if it does not afford permanent relief, it does no harm, because, supposing the gum heals and a cicatrix forms, it being of the lower form of tissue is more easily broken down by advancing teeth. Having seen many cases where the lance has been beneficial, I firmly believe in its intelligent use. In at least one case to which I was called the child was on the verge of convulsions, rolling the head and eyes, and in a state of evident stupor. The free use of the lance acted like magic, and in less than half an hour the little patient was enjoying a sound and natural sleep, the first in two or three days.

Dr. Abbott reports a case of otalgia. The patient, a lady, had been under treatment by an excellent aurist for some time without benefit and was suffering at the same time from pain in a right lower molar which had been filled some fifteen months before. Upon opening the pulp chamber the pain which was in the ear, which at that time was quite severe, left her and in a few days the ear was perfectly well, and has given her no trouble ever since. In this case the dying pulp was the cause.

Dr. Garretson mentions two cases of otalgia from dental irritation. One of five weeks' standing was caused by nodules of dentine in the pulp of the third molar, and in the other the eruption of the third molar was the cause, extraction in both cases being followed by immediate relief.

In a case of my own there had existed for three years a recurrent gathering in the ear, which commenced together with the appearances of catamenia, and broke in from three to five days. Cure was effected by the removal of the roots of the lower second molar, and there had been no further trouble.

Time will not permit me to refer to more than a case or two, and so we will consider next muscular disorders arising from teeth.

Facial spasm is due to irritation of the facial or portiodura nerve, and is generally confined to one side of the face, while the irritation may arise centrally from a diseased condition of the teeth, as a case or two will testify.

Dr. C. N. Pierce reports a case of a child, aged fourteen, who was suddenly seized with marked spasmodic contraction of the superficial muscles of the right side of the face, which was continuous. It was found that the lower second molar of the right side had not erupted, owing to an indurate condition of the gum covering it. After liberating the crown by excising the indurated tissue, the muscular spasm soon subsided and entirely disappeared. Trismas or tonic contraction of the masseter muscle, due to irritation of the motor root of the fifth, is often caused by dental disease. The chief cause seems to be the irregular, painful eruption of the third molars. I have met with several cases, one a year ago this past summer, which occurred on the right, then on the left side some weeks after. The extraction of the erupting third molars on each side effected a cure.

Some years ago I had a very interesting case which from the circumstances attending it remains vividly impressed upon my memory. The patient, a man aged about thirty, was referred to me by a medical man to whom he had applied for what he thought was pneumonia, as he was suffering severe pain in the right breast. Upon careful examination I found the first and second right lower bicuspids tender to percussion and both badly decayed, and recommended their removal. The severe spasm which occurred coincident with the easy removal of the first bicuspid I shall never forget, as while it only lasted a few seconds, was apparently fatal, and nothing would induce him to consent to the removal of the other, as he said the pulling of the tooth did not hurt him. It was the pain in the chest. I did not see him again for about a year, when I met him on the street with his face bandaged, and later in my office learned that he had been in a hospital in a neighboring city for five weeks for a diseased jaw, and had seven incisions in his cheek. I removed the remains of the second bicuspid, and after washing out the socket thoroughly sent him home, and he reported some time after that in less than two weeks he was entirely well.

That pathological conditions of the teeth do by indetermination of nervous system cause ocular disorders is not generally entertained by those making a specialty of the diseases of the eye, although there are enough authentic cases on record to prove the claim. I will only refer you to a case or two.

Mr. S. Jonathan Hutchinson reports the following case: "Mrs. Higdon, aged twenty-eight, a woman enfeebled by nursing, stated that she could not see well, and had suffered for a month past with pain in the eyeball and forehead. Pain was severe but not constant, and clearly of a neuralgic character. The eye was watery, irritable and intolerant to light so as to almost exclude the test of vision being made. She had no toothache, but examination revealed the presence of a carious molar, which was removed, and the pain ceased immediately and the eye was no longer irritable."

Dr. P. D. Keyser reports a case of corneal inflammation and beginning ulceration in a young man, aged thirty-three. The left eye became inflamed without any apparent cause. There was infiltration of the cornea with a small spot of beginning ulceration in the center. There was little pain. Anesthesia of cornea was present, as the touch of a feather was not felt. Usual treatment for inflammation was contiued for three weeks without effect. On the last day of the third week patient presented with severe toothache, and stated that he had suffered for months with it, off and on. Found first molar on that side much decayed and pulp exposed. With its removal the cornea began to improve rapidly and by treatment became clear again.

Dr. DeWitt reports the following case of a gentleman who, while firing a gun, first discovered that he was blind in the right eye, vision having been lost without his being able to ascribe any cause for it. The eye remained in this condition for twelve years. Inquiry revealed the fact that some months before the loss of sight he had had several teeth filled, and that not long after he had one of these teeth extracted in consequence of its aching. The other teeth had not given him any trouble. Examination revealed a cavity in the right upper first bicuspid neatly filled with some white metal, which showed a fistulous opening opposite the apex. He said there had for some time been soreness and tenderness at this point. The removal of the filling and proper treatment closed the fistula and relieved the soreness.

About three weeks subsequently to this. when the eye had become nearly as good as its fellow, the soreness in the gum returned and vision simultaneously became blurred, but upon extraction of the tooth the blur immediately disappeared, and Mr. P—— can see quite as well with the right eye as with the other.

While these cases are very interesting, time will not permit me to recite more than just a few; but a review of our literature will show many, and their study will reveal the fact that the teeth do enter into the cause of many diseased conditions, which, to one possessing the knowledge, means greater usefulness in the relief of suffering humanity.

We will now refer to some of the conditions which may arise from constitutional ailments which are reflected to the teeth, and in this connection I fully realize the difficulty that may present itself in the fact that local lesions may be present, which, however, are greatly intensified by the trouble. Where no local lesions are found to account for the expression, we are forced to attribute them to the systemic conditions which may be at work. The diagnosis of such cases is also rendered more obscure by the fact that certain local causes may be concerned in the production of the discomfort, which do not show themselves or their surrounding tissues. For example, the presence of secondary dentine in the pulp chamber or exostosis of the roots, or even the galvanic action caused by proximity of different metals, but aside from these there are still cases to be accounted for only by systemic conditions or organic trouble, located elsewhere than at the point of expression.

Of these conditions may be mentioned syphilis, grip, gout, rheumatism, intestinal derangements, vesical diseases, dyspepsia, malarial influences, neuralgia, hysteria and other neuroses, as well as various so-called sympathetic influences connected with pregnancy, the menstrual period and other uterine conditions.

As it is the province of the physician to trace out the true cause of the various manifestations of neuralgia or other morbid expressions which have so frequently been found to be caused by lesions of the dental organs of their surrounding tissues, so it becomes the duty of the intelligent dental practitioner to study each case, and failing to discover the cause in the teeth themselves, to be able to point out to the patient, or better, the attending physician, the probable constitutional derangement which the symptoms suggest to him.

The sympathetic conditions which exist between the teeth and alimentary canal are clearly shown by the marked effect of pathological dentition upon mortality of infants, and this sympathy is shown in later life by the frequent occurrence of discomfort, and even severe pain in the teeth when there is a diseased condition of the intestines. I have met several cases in which there was severe pain without any apparent local cause in typhoid fever, which as the disease developed has passed away, and Dr. J. Foster Flagg says, "General tenderness of the teeth and peridental members will also be sometimes found as a concomitant with various diseases of childhood and of more advanced periods of life," and mentions more particularly measles, mumps and scarlet fever, and attributes the irritation of the peridental membrane to be purely sympathetic, or due directly to contiguity with highly irritated tissues.

The condition known as "biliousness" may be preceded by a peculiar hypersensitiveness of the teeth. An attack of dyspepsia is by many more readily recognized by the uneasy sensations of the teeth than by any epigastric disturbance. In seasickness and sick-headache the nausea is very frequently preceded by an intense discomfort in the teeth, and in some cases even extreme facial neuralgia, which disappears after emesis.

Cases are recorded where the passage of a gall stone or renal calculus has been preceded by intense neuralgia.

You have all doubtless recognized the hypersensitive conditions of the teeth of pregnant females, and I have noticed similar conditions to exist in some patients during the catamenial period, and have frequently postponed operation for a few days, with evident relief on the part of the patient, and found the teeth normal at the next sitting.

Dr. A. P. Brubaker says: "Beyond the mere fact, however, that there is a close relationship between these remote structures, nothing definite is known. There is no direct connection through the intermediation of nerves between them that physiologists are aware of, and yet it is indubitable that some such connection must exist to explain the occurrence of symptoms both in uterus and teeth which stand to each other in the relation of cause and effect."

The following case, reported by the late Dr. Garretson describes so exactly one that occurred in my experience that I have taken the liberty of quoting it to show that diseased conditions of this organ do cause trouble apparently in the teeth, while there is no local cause.

A woman, aged twenty-five, who had complained of odontalgia in the lower bicuspid, which had persisted for a period of nine weeks. As the pain had been unbearably severe and the tooth carious, it was extracted without any relief. In the absence of any lesion in the mouth to account for the pain, a general examination of the system was instituted, when it was discovered that the inner surface of the fundus of the uterus was ulcerated, the cure of which was followed by the disappearance of the toothache.

A very interesting case of odontalgia occurring during parturition is reported by Dr. S. W. Caldwell, which was related to him by the patient, a very intelligent woman, the mother of five children. She stated that her periods of gestation had been marked by nothing unusual, her labors had been natural and of about eight hours' duration. During the last labor, after suffering about an hour, the pain suddenly left the back and womb and appeared in a tooth that had given her pain occasionally during the past few months. The pain, like that which had been felt in the womb, was of a paroxysmal character. Upon the arrival of the attending physician, he placed a pledget of cotton soaked in chloroform in the tooth, when the pain was instantly relieved, only to appear again in the back and womb. The effect of the anodyne soon passed off, and the pain returned to the tooth, which was relieved again and again by chloroform. During the time no progress had been made in the labor. Twelve hours had passed, though her former labors had terminated in six or eight hours. As she was becoming exhausted, she decided to have the tooth extracted. This was done, and the child was born in an hour.

I might go on indefinitely reciting cases of reflexes that have been reported, but must not impose further upon your patience, so will bring this paper to a close by reporting two cases which, while foreign to the title of this paper, will perhaps be of interest to you as explaining the cause of some at least of the secondary hemorrhages which occur as they are caused by what is known as vicarious menstruation.

1. Mrs. A. applied for treatment and had extracted the upper first molar, which was badly decayed, without any difficulty and no laceration of the gum. The hemorrhage was slight and ceased in a few minutes before leaving the office. Five days later she returned and reported that the previous morning she had been awakened by a severe hemorrhage from the socket, which continued for three or four

hours and then ceased, but had commenced again that morning and still continued. The usual treatment easily checked it, and suspecting the cause, ascertained that it had occurred simultaneously with the appearance of the menses.

2. Mrs. B. applied for the arrest of a hemorrhage from what she had thought the cavity of the left upper molar. She had previously applied to a druggist, who had packed the cavity without checking the bleeding. Upon removing the plug and freeing the mouth of blood, I found the cause to be located back of the second molar at the cervical margin of the gum. Upon packing the pocket between the teeth and gum the hemorrhage ceased, and had not recurred three days after, when she called to have the packing removed, and by being pressed for an explanation, revealed the condition to be the same as in the other.

THE DENTAL SOCIETY: ITS OBJECTS, ADVANTAGES AND ORGANIZATION.*

BY DR. T. E. WEEKS, MINNEAPOLIS, MINN.

The old idea of secrecy and seclusion finds no place in the minds of the dental profession of today; it is generally conceded that contact with others, resulting in an interchange of ideas and methods, is a great stimulus to individual growth. Upon entering a restaurant in any of the larger cities at the lunch hour it is not uncommon to see several dentists seated together. If invited to join the group, you will find that the conversation, while not dominated by shop talk, is generously interspersed with incidents of practice and new ideas gained from reading or from conversation.

Who of you that have been privileged to join some of these jolly groups during visits to Chicago or the Twin Cities did not return home with new ideas and renewed vigor for your daily tasks? This is association. The society aims to provide opportunity for such mingling together at a stated time and place, frequently for several days together, in order that the commingling may be general; object, general improvement. This great primary object does not recognize any political factors, and none should be permitted to creep in. The advantages of such association are its natural children—they can not help being born, and their surname is "individual growth." In the prospectuses these advantages are called "mutual improvement."

---

* Read before the North Dakota Dental Association, January 16, 1906.

In all organized societies it seems necessary to observe certain formalities, for without some rules of order and a governing head time is wasted and little of lasting benefit accomplished. Every one who has occupied the chair knows how difficult it is at times to keep the discussion within the lines of the subject in hand even when supported by definite rules; so we have a constitution and by-laws by which the society is governed. These name the officers and define their duties, set forth the objects of the association, define the duties of members and furnish such laws as seem necessary and wise for the government of the body.

Given a desire on the part of a number of dentists to associate themselves in an organized society, nothing is of so much importance for the future welfare of the society as a wise constitution. Believing this, the bulk of this paper will be devoted to suggestions based upon experience and observation. First, the constitution should be free from high-sounding phrases and useless verbiage—concise, brief and to the point. As an illustration I will cite the constitution of the National Institute of Dental Pedagogics, which is but little longer than the name of the society; but under it you have seen the society grow from its original form as the National School of Dental Technics, until now it embraces all that pertains to dental pedagogy, counting among its members the majority of the dental colleges of America and standing in importance and usefulness second to no other organized dental body in this country. The problems confronting that body are no different from those which will present themselves to you as a state organization. Being familiar with this document from assisting in its framing and working under it for a number of years, these suggestions will naturally be in harmony with it, although differing in some points. The object may be briefly stated as mutual improvement and the advancement of the profession in the State.

The membership in a State society should, in my opinion, embrace all reputable dentists in the State who will subscribe to the constitution and code of ethics. This code must be the one prescribed by the National Dental Association, if you desire representation in that body.

It has been urged by some that membership in dental societies should be restricted to those who will agree to contribute something—a paper, clinic or discussion, at stated intervals. This is wise for a local or district society; these *should be* training schools for the State body. If conducted on this plan, a rule limiting membership to those willing to work would accomplish better results than if the drones were admitted; drones are of little use, and where all the members of a body work there is apt to be less politics.

The opponents of such a rule argue that societies are organized to educate; hence all should be admitted. My observation is that you can not educate a man who does not desire education. If he does desire it, he will seek the means; furthermore, no one ever criticised or turned his back on a society which fulfilled the objects for which it was organized, but only when it degenerated into a ward caucus.

Another observation: If every man goes to the meeting with something, be it ever so small, there will be so much doing that the long-winded fellows with axes to grind will never get near the grindstone.

Gentlemen, it rests with you individually what the future will be. If each of you will spend the time usually consumed in hunting up something to criticise, in searching for something from out your store of experience, furbishing it up and getting it ready for presentation at the next meeting, there will be nothing to criticise. I hear some one say, "I can't write a paper," or "I can't clinic," but who among you would be willing to acknowledge that he had not some idea that might be told in a line or two, or some little part of an operation which he believes would improve the operation? Did the man who suggested using vaseline on sandpaper disks write a paper to introduce the idea?

Having disposed of the membership clause, the next consideration is the officers. Here I shall offer some suggestions which you may consider radical, but they are based upon the experience of the Minnesota State Society and that of the body already referred to. These bodies, through the power of their constitution and by unwritten laws which have so grown into custom as to appear as though incorporated in the written laws, have operated very closely in line with these suggestions. Under this idea, an executive committee which shall transact all the business of the society is the central figure. This committee should consist of the president, vice-president and three others, with the last two past-presidents as advisory members.

At the time of organization the president, vice-president, secretary, treasurer and the three members of executive board—one for one year, one for two years and one for three years—should be elected. After that one member of the executive board, to serve three years should be elected each year. The constitution should provide that the vice-president succeed the president; the three-year man, who served that year as master of clinics, succeed the vice-president, and the two-year man become master of clinics, the one-year man become secretary of board; then the only officer to be elected would be one member of the executive board, and the secretary and treasurer. This would materially lessen the time consumed in election. It would abolish nominations from the floor by having members declare their candidacy for these three elective offices. I would also abolish all other standing committees.

This plan provides a means for educating your officers, as under it there would never be more than one man on the board of less than one year's experience. Under this plan, no business would be brought before the house until it had been submitted to and acted upon by the executive board. Many matters need never come before the house at all, as they could be justly disposed of by the board. Those matters which are referred to the house for vote should be reported to the house at one session, and voted upon without discussion, at a subsequent session, and at an hour fixed by the president. This would do away with all tedious time-killing discussion before the house and give every member a better opportunity to vote intelligently, as all would have ample time to acquaint themselves with the merits of the question.

The great object of such a plan is to leave all the time of the society for the presentation of papers and their discussion. That is what the boys from the country come for—not to hear the half-dozen men who always monopolize the floor discuss whether we shall send roses or carnations to the family of a deceased brother, or some equally vital question.

You may object that this involves too much work for a few, and also gives control to a few. Did you ever see a society where a few did not do most of the work or one where the few did not contrive in some way to control its affairs? This plan only acknowledges the inevitable, legalizes it and makes the path smooth.

As you are aware, in many societies the vice-president is little more than a figure-head, whose only opportunity to shine is while the president reads his address. He is usually some member who is known to cherish ambitions that the society deem wise to side track, or one whom they recognize as deserving honors, and so proceed to honor by insulting him with this empty office. True, some societies advance their vice-president to the presidency, but in such cases what training has he for the position? It is often the case, too, that the president has little more responsibility—unless he assume it—than to look wise and preside at the meetings. He should be given power by the constitution to direct the affairs of the society during the whole year of his incumbency and be held accountable for the proper discharge of his duties.

To summarize: The composition of the board should be the president of the society; vice-president, acting as chairman; three-year man, master of clinics; two-year man, secretary of the board; one-year man, learning and helping all he knows how, with the two past-presidents assisting with their counsel and advice based on their years of experience. This, with a secretary, to keep the records and assist the executive board in editing and publishing the proceedings, and a treasurer to collect and disburse, under proper authority, the funds of the society—this would constitute the machinery which is to do the work.

The duties of such board are to provide programs for the meetings, consider the applications for membership, reporting the same at the sessions of the regular meetings, make all arrangements for place of meeting, purchase supplies, audit all bills and draw warrants on the treasurer for their payment. In fact, transact *all* business, receive all motions, and report for or against them at the next session, to be voted upon without discussion at a subsequent session.

The duties of the members are, first, to see to it that the executive board is made up properly; having done this, give them your unqualified support. You have washed your hands of all business and politics and are free to devote your energies to preparing something which will enable your officers to provide programs which will draw a crowd.

Having proceeded so far with your constitution and by-laws, you may well ask what more is there to legislate? There it is, the whole thing in a nutshell. All those little things which are usually incorporated in laws are referred to your executive board, who are responsible to you for a proper solution of all these problems.

In conclusion, gentlemen, let me urge you to weigh this matter well. That you are all earnest and honest in your determination to make this North Dakota Dental Society a success is a foregone conclusion. The ideas I have advanced are not mine alone; they are shared by many. Many of you have seen the working out of some modification of them, and I feel sure you will all agree that the closer they were followed, the more satisfactory and successful were the meetings.

In the society, as in the world, unhappiness and strife arise from envy and jealousy, and peace and happiness come to him who observes the golden rule and that other command, "Love thy neighbor as thyself." This is the second of the two commandments upon which hang all the law and the prophets.

REPORT OF COMMITTEE ON DENTAL SCIENCE AND LITERATURE.*

BY E. H. ALLEN, FREEPORT.

In looking through the published accounts of what is being done in dental science and literature since the meeting at Moline, in May, 1905, I have to depend chiefly upon the monthly journals to learn what is doing in our profession. I have had eight or ten of these journals to look through, and coming as they do from the eastern, middle and western States, I think I have had a reasonable opportunity to arrive at a fair estimate of what has been brought forward this past year. Nothing of a startling or unusual character has taken place. But as a whole the profession is going onward. We are a profession composed of earnest and intelligent men and women. We work hard and long, striving to reach as near the goal of perfection as possible. We do quite as much for humanity as any other profession. Admitting all this, I feel that in some way we have failed to impress upon the world that we are a profession, at least to some extent. To explain why I have such a feeling, I will say that a few months ago I was reading a short article on the editorial page of the *Saturday Evening Post* in which the professions were under discussion. The clergy, medical men, lawyers, teachers, and even the barbers, were mentioned, but not one word about the dentists. Do we, as dentists, fail to impress upon the communities in which we live that we are a profession, and do they regard us as simply mechanics, with special training about the teeth? I see that a Tennessee judge has decided that we are both. The editor of one of our journals, a few months ago, criticised the papers usually read before our society meetings, saying that they show a "falling off in scientific value and a waning of vital interest and thought in the discussions of such papers as are presented." This criticism is not without ground to stand upon, but is too sweeping in its severity, and I can not feel that this society deserves but a small portion of it. I have noted, as I reviewed the literature of the past year, the different subjects and number of papers published under each subject, which are as follows:

---

*Read before the Illinois State Dental Society, May, 1906.

Prosthetic dentistry, 21; operative, including gold fillings, 24; porcelain inlays, 23; gold inlays, 3; cements, 5; porcelain crown, 16; jacket crown, porcelain, 4; orthodontia, 27; cavity preparation, 4; dental hygiene and asepsis, 15; porcelain, 9; alloys, 2; bridge work, 27; oral surgery, 23; pulp devitalization and treatment, 8; care of the teeth of the poor, 1; anesthesia, 19; pressure anesthesia, 6; pathology, 12; ethics, 4; miscellaneous subjects relating to business, etc., not directly connected with practice, 10; x-ray examination, electric light, its effects on living tissues, 2; pyorrhea, 12; oral prophylaxis, 2; physiology, 1; dental education, 9; study of saliva, 3; dental therapeutics and materia medica, 2; comparative anatomy, 1.

The several journals have devoted a part of their space to the short, practical helps which are becoming a valuable part of their contents.

Among the papers noticed to which special attention should be called are: Preventive Treatment of the Teeth by Use of Silver Nitrate, by W. D. Miller; Uratic Deposits on Roots of Teeth, by Jules Endelman; Plaster of Paris and Compounds; Its Properties, by Wilson; Dentition in Relation to Infant Mortality in Manila, Ottofy; Education, Literature, Nomenclature and History, Sec. 9, Fourth International Dental Congress, Chairman Brophy; Dental Education, James Truman, Fourth International Dental Congress; Reciprocity between Dental Examining Boards, Stockton; Mechanical Treatment of Congenital Cleft Palate, Case; Possibilities of a Professional Career, Johnson; Requirements of Modern Bridge Work, Goslee. See Dental Review for May, 1905, and read discussion. Non-Eruption of Teeth Due to Impactions, Their Liberation and Restoration, Case; Diet in Health and Disease, A. B. Spach, M. D., read before Chicago-Odontographic Society; The Chicago Erosion Muddle, by E. C. Kirk, and reply to Kirk's criticism by the Erosion Committee, Hinkins, Cook and Buckley. Dr. Cook has just published a paper in the Dental Review on Erosion of special interest, to which your attention is directed. A Few Thoughts on Dental caries and Its Rational Treatment, Henry L. Banzhaf, read before Chicago-Odontographic Society. Special attention is directed to a paper on Atrophied Teeth, Dr. G. V. Black, read before Chicago-Odontographic Society. Three Years' Service in the Philippines, by Dr. Robt. T. Oliver, United States dental surgeon; this is an interesting article. Obstetrical Deformity of the Mandible, Langdon D. Chilcott. Infectious Diseases of the Mouth, Midgley. The X-Ray in Dentistry, Satterlee. The Question of Extracting in Orthodontia, title of an article by C. S. Case, in April Cosmos, to be continued. Review of Prominent Manipulators of Gold Foil, Burton Lee Thorpe. Pathological Processes in Extra-Oral Teeth, New Theories Concerning Decay of Teeth, W. D. Miller. Porcelain Problems, Nyman. Problem of the Bites, Christensen. The Chemistry of Pulp Decomposition, with reference to the discoloration problem and a rational method of treating these conditions, J. P. Buckley. Interstitial Gingivitis, Talbot.

These are a few of the many good scientific papers that have been published during this past year. Many more are well worthy of mention, but time and space forbid.

Books—A Manual of Mechanical Dentistry and Metallurgy, by Geo. W. Warren, A. M., D. D. S.; The Role of Modern Dietetics in the Causation of Disease; a text-book of Dental Materia Medica, Therapeutics and Prescription Writing, for students and practitioners of dentistry, by Eli H. Long, M. D. (second edition); Manual of Chemistry (eighth edition), by W. Simon, Ph. D.; American Text-Book of Operative Dentistry, edited by Edward C. Kirk, Philadelphia (third edition); Evans' Crown and Bridge Work (eighth edition); Naked Eye Anatomy of the Human Face, Thos. E. Kent; Dental Surgery for Medical Practitioners and Students of Medicine, A. W. Barrett; Anatomy and Physiology of the Mouth and Teeth, Dr. E. Sauvez; Notes on Dental Porcelain, a practical treatise, especially devoted to the interests of the beginner, V. Walter Gilbert.

REPORT OF THE COMMITTEE ON DENTAL ART AND INVENTION.*

BY CHARLES E. JONES, D. D. S., CHICAGO.

Your committee has labored in hopes that a suitable report and presentation might be made of the many new inventions and the status of progress made in art during the past year by the profession. In pursuance with this object, we corresponded with the majority of this year's patentees, numbering near one hundred, and have met with liberal encouragement and kind assistance from them. But we found many who were not yet ready to present their inventions for inspection.

While an equal number of inventions have been recorded as in the preceding year, nothing of especial importance has attracted the attention of your committee. But we hope the articles presented will convey to some of you an idea of the many useful appliances now being placed at your disposal by the ingenious minds of those laboring for the good of the profession.

Your committee is indebted to the following manufacturers for the many courtesies they extended us: S. S. White Dental Manufacturing Company, who have kindly arranged the exhibit for your inspection; Consolidated Dental Manufacturing Company, Frink & Young, H. D. Justi & Son, Chicago Dental Manufacturing Company, J. Austin Dunn Specialty Company, L. J. Mason Supply Company, Cleveland Dental Manufacturing Company, The Sibley Dental Supply Company, and to many others.

The S. S. White Dental Manufacturing Company present the following new dental appliances:

DOUBLE ACTION AUTOMATIC MALLET.

This new Double Action Automatic Mallet is about the same length and weight as a single action mallet. As a matter of fact it is actually lighter than most single action mallets. It is also for the greater part of its length slightly less in diameter than most other mallets, both single and double. It is one of the first high-class double action mallets of this desirable size. It has six lengths of stroke and means for setting the mallet at any desired stroke.

---

* Read before the Illinois State Dental Society, May, 1906.

The decrease in size and weight and the great variety of strokes are obtained by an entirely novel construction, viz., the annular pawl and ratchet mechanism. This is a distinct advance in automatic mallet making, also greatly increasing the wearing qualities.

HOLDFAST ENGINE BELT.

The Holdfast Splice makes the belt practically one continuous weave without a break in the smoothness of its surface, and the splice is as strong as any part of the belt.

WAX SPATULA NO. 34.

Designed by Dr. Fred A. Peeso. Is double-bladed, one blade being full-curved, the other half-curved. Both blades are narrow and flat, with rounded edges and ends. Suitable for delicate manipulation of the wax in setting up plate work.

ZINCOID CEMENT.

This is not a tooth-filling cement, but is especially devised for dental inlays, crowns, bridges and orthodontic fixtures. Made in six colors.

ADJUSTABLE PORTE-POLISHER.

An adjustable porte-polisher, with clamping jaws, which grasp the orangewood firmly at an angle which gives almost unlimited possibilities in manipulation.

CONTRA-ANGLE EXCAVATORS.

Made in four sizes in cone-socket points (only). These Contra-Angle Excavators have no tendency to wabble when pressure is applied. They also afford considerable advantage in reaching cavities inaccessible to straight-shaft instruments.

PLASTER PLANE.

Devised by Dr. Edward H. Angle. Made of brass with a phospho-bronze blade to prevent corrosion. A handy instrument for trimming models correctly.

"REVELATION" BUR GLASS.

An appliance for the examination of Burs which gives a remarkable clearness of definition, with an enlargement approaching that of a low-power microscope.

S. S. W. DETACHED-POST CROWN.

Natural shapes and countersink of Logan Crowns duplicated. Pin non-rotating and of I-bar type, providing greatest strength in direction of greatest strain. Can be used in connection with 16k or 18k solder.

THE CONDYLOID CROWN ARTICULATOR.

The Condyloid Crown Articulator consists of a pair of tray-shaped plates furnished at one end with peculiar shaped projections, one of which fits into the other, forming a ball-and-socket joint, allowing the trays to be moved in every direction the jaws can be moved. The projection and depression at the other end act as the median-line guide.

DIAMOND DRILL, EXTENDED POINT.

The diamond is set deeply in the socket and furnishes a rapid-cutting, durable tool. Should be run at high speed, with plenty of water.

DENTATE SCALERS.

Made in six shapes, all having a similar dentated working point or cutting edge. The shank is attenuated to form a rather thin blade. The extreme end of the instrument is beveled at an angle of about 45° to the face. The partitions between the grooves form with the chisel edge of the end a series of teeth, which can be sharpened by merely grinding the bevel at the same angle. Their use is in breaking up and removing deposits of tartar.

PARTS NOS. 7, 8, 9, OF BRYANT BRIDGE-REPAIR OUTFIT.

These accessories to the Bryant Bridge Repair Outfit will be found to extend its usefulness in various ways, such as setting platinum pins in gold plates for vulcanite attachments, or the setting of anchorage screws for large fillings.

HOLDING INSTRUMENT.

Invented by Dr. G. V. Black for holding gold while it is being secured in the cavity in filling teeth, particularly in starting fillings. The instrument is held in the left hand. It will not shift nor turn while the right hand is doing other work. In other words, it stays "put," holding the gold steadily.

DONALDSON GOLD-PLATED CLEANSERS.

Gold-plated pulp-canal cleanser and bristle. A distinct improvement over the steel cleansers.

MATRIX EASE.

Matrix Ease acts as a swage to conform the matrix accurately to every inequality of cavity walls. Enables the practitioner to burnish forcibly against it without hardening the matrix. Less annealing of the metal is therefore required. It is a preparation of gum-camphor, so treated that its tendency to crumble is eliminated whilst its rigidity is maintained. The Matrix Ease burns out, leaving no residue.

EXPLORER NO. 23.

A new shape, with a wide range of usefulness, reaching many cavities not readily accessible with the ordinary form of explorer.

ABBOTT'S MANDREL-MOUNTED TOOTH-BRUSH DISKS.

Mounted on mandrels to fit chuck hand-pieces, these tooth-brush disks will be found effective, convenient, and economical in removing stains from the teeth, and in polishing their surfaces. Made in five forms and two grades of bristles, medium and stiff.

DETACHABLE TOOTH-SHADE GUIDE.

The carriers for the teeth are detachable from the holder, thus permitting individual handling. The teeth are smaller than heretofore, and each tooth being pivoted to its carrier permits of rotation, thereby facilitating matching the various teeth in the mouth.

FUSIBLE METAL LADLE (NO. 8).

The bowl is of cast-rough nickel-plated, with a flat bottom which will set level, and a spout which will deliver the metal in a stream fine enough to go into the smallest casting ring without spilling. The bowl is sufficiently thick to avoid over-heating and yet retain the heat, keeping the metal in a fluid condition for some time.

HARVARDID PORCELAIN CEMENT.

A new translucent cement filling. May be described as one which can be inserted in a plastic condition. Will set without shrinking, be compatible with the dentine, non-irritating to the pulp, non-conductive to heat, becoming nearly as hard as the tooth itself, having that translucent, smooth surface which distinguishes the enamel, and possessing a range of colors which will permit of a selection to match any tooth surface. Put up in one-color boxes and four-color boxes.

This porcelain works like Harvard Cement and the use of a bone spatula is recommended to avoid discoloration of the fillings as occurs in the use of a steel spatula.

The Consolidated Dental Manufacturing Company present the following new appliances:

ASEPTIC RIGHT-ANGLE HAND-PIECE.

This sterilizable hand-piece completely supplies every requirement to insure entire asepsis.

It can be taken apart and assembled in a moment without removal or loosening of any screws, nuts, or clamps, or necessitating any adjustment or special regulation of the parts. All the parts are accurately made which renders it very stable and gives it unusual smooth running qualities, as well as minimizing the wear.

CRESCENT AMALGAM CARRIER.

This instrument fills the long felt demand for a first-class amalgam carrier. The amalgam can be carried in the end of the tube to any part of the mouth; then by slight pressure on the shaft with the thumb the amalgam is ejected into the cavity without the waste, awkwardness or uncertainty which is encountered with many other instruments.

RUBBER DAM PUNCH.

A unique device of practical value is the octagonal faced cylinder dam punch, perforated with six holes of different diameters. Its inner bearing is grooved and by the action of a ball-ratchet the cylinder is held firmly in any desired position under the point; by revolving it, each face stops automatically, with the hole exactly beneath the point.

While holding the dam in place it is easy to turn the cylinder without interference, as the serrated end, or grip, is entirely free.

THE CRESCENT SEPARATOR.

This separator is simple, compact and easy to adjust. It can be used with equal facility in any part of the mouth, and in operation it is more convenient and less bulky than many other separators now in use. Both jaws are movable, but one only should be worked at a time, according to the side of the mouth operated upon; the other, not in use, should be screwed up tight. The instrument lies on the surface of the tooth, permitting the insertion of the wedges close to the gum, if necessary. It is simple and effective; its particular advantage is that it does not obstruct the operation. It is regulated by a separate screw key. The edges of separator are beveled.

DUNHAM FLASK-PRESS.

This flask-press can be adjusted to hold either one, two or three flasks. Pieces of pipe heretofore required on the rigid frame Dunham Flask-Press are dispensed with. The clamp-plate slides up and down on the frame bars; a clutch in the rider grips the notches in the frame bars, affording a firm purchase when the plate is screwed down and insures even pressure on all parts of the flasks. The clamp plate, riders and spring are made of tempered steel. All the other parts are of solid brass, nickel dipped. A long hook for lifting it from the vulcanizer is furnished with each press. This press is simple, strong, of very small bulk and unusually easy to adjust.

THE CONSOLIDATED HIGH-FUSING PORCELAIN OUTFIT.

This case contains twenty-three jars of prepared high fusing porcelain bodies, ready to mix with alcohol or water and fuse. The colors are carefully selected, affording a wide range for matching the shades usually found in the natural teeth. The life-like blend of color and translucency of surface, possible with high fusing bodies only, is shown in the fused buttons on the shade ring. Each is lettered to correspond with the bodies and indicates the exact shade obtained in fusing them; the depth of a shade varies slightly, according to thickness.

The shade ring is very convenient, practical and strong, requiring the use of one hand only for matching teeth in any part of the mouth. The ring facilitates independent use of any bar and affords close and direct application. It is not stiff or clumsy, and there is no danger of losing or misplacing the bars. The outfit is put up in a strong polished oak case with a compartment for each jar and the accessories.

A MANDREL.

A mandrel for holding cone-shaped disks, invented by Dr. Harriman of Pontiac, Ill., while not altogether new has such marked merits that I do not hesitate in presenting it. The end of the mandrel being concaved, the disk conforms to this shape when mounted and may be used to finish near the gingival line without destroying the point of contact.

THE DR. G. A. SAVAGE ROUND END INLAY BUR.

A fine cut bur for preparing the margins of cavities. Furnished in two sizes; also for the right angle and straight hand-pieces.

THE DR. G. A. SAVAGE INLAY BURNISHER.

An instrument designed for burnishing matrix material over margins of cavities. It seems to have splendid merits.

THE DAVIS CROWN ROOT REAMER.

An instrument for the hand-piece and so shaped that perforation of the root is almost impossible. Has pointed end which follows root canal accurately. Reams out the root to accommodate the Davis Crown.

DENTAL WASTE RECEIVER—PRESENTED BY JOHNSON & JOHNSON.

A cardboard carton with self-closing opening held in a nickeled standard with loaded base.

The pledget of cotton, or bibulous paper, after use is deposited in the carton, the cross-cut opening at the top disengaging it from the pliers. No need of emptying and cleaning. The carton is burned with contents after use and a new one placed in the base.

This receiver overcomes the spreading of infectious matter, disagreeable odors or infection of instruments from previous operations. All unsightly and offensive waste is hidden from sight. One of the splendid inventions of the year.

Frink and Young present the following new appliances:

DR. DAVIS' NEW COMBINATION SEPARATOR AND MATRIX.

The great advantage of this appliance is that it is complete both as a separator and as a matrix for the anterior teeth. In combination it is used as a matrix, and yet furnishes an excellent separator when used alone. It gives two instruments in one. By turning the set screw in the arm separation of the teeth may be secured. The filling can be built to its full contour by tightening the screw in the bar which forces a steel band against the lingual surface, which makes a floor that is strong enough to resist the blow and pressure that is necessary in condensing gold fillings.

A COTTON ROLL HOLDER AND SHIELD.

A very ingenious device for holding rolls of cotton in position around the teeth while operating. Furnished in two sizes.

FREEMAN RIGHT ANGLE HAND PIECE.

A hand piece having an adjustable head and with great range of angle. It has a flexible steel coil spring in the shank which permits of almost any position or angle being secured by the bur.

J. Austin Dunn Specialty Company present the following new appliances:

COMPRESSIBLE CELLULOSE OILER.

A very small tube which permits of small drops, with no waste. Light compression of the tube when in the bottle will cause it to slowly fill itself with 30 or 40 drops of oil; hence it is always filled and ready for use.

A MEDICINE DROPPER, WITH CELLULOSE BULB.

The new feature applied to this dropper makes it much more desirable than the old style—the drops are under better control and the danger of infection from the bulb is eliminated. The least compression takes up and holds a few drops in the end of the glass tube where wanted and none enters the bulb or drops on the floor. The glass tube can be adjusted to a long or short reach inside the bottle. The bulb can be sterilized in hot water if desired.

A CEMENT LIQUID DROPPER, WITH CELLULOSE BULB

Is much cleaner than the ordinary rubber bulb dropper.

The least compression takes up and holds a few drops in the end of the glass tube without permitting any to enter the bulb. The cork is rubber and the bulbs are in three colors—clear, green and amber. Can be taken apart and cleaned in hot water.

The Cleveland Dental Manufacturing Company present the following new appliances:

ALUMINOID IMPRESSION TRAYS

These impression trays are made of an alloy of aluminum. The inside is frosted to more easily retain the plaster. They are light, cleanly, and will not tarnish as the old style cups do. While not so pliable as the Britannia metal, they are still pliable enough to meet the requirements of most operators. At the same time have considerable more strength than the stamped aluminum trays.

PROXIMAL ENAMEL CLEAVERS, with octagon shaped handles.

SCREW ELEVATORS, with large metal handles.

SIMPLEX BROACH HOLDER.

This broach holder has in place of the brass chuck so generally used, a universal steel chuck that may securely grip even the smallest of wires. The handle is octagon shaped, made of vulcanized rubber, with a hole in the center of its entire length, so that it can take any length of broach.

THE PERFECTION ANNEALER.

This annealer has a tray made of pure nickel and an arrangement placed underneath the tray which prevents the flame from coming in contact with the nickel and at the same time directs the flame outward, so that the heat is approximately the same all over the tray. The article is suitable for gas or can be used over an alcohol burner.

BUR BOX.

This box is a practical bur case. It can be folded and kept in a small compartment when not in use. It is beautifully finished in golden oak, neat, strong and compact. The folding feature is one of the good points which should appeal to all. Burs can be instantly arranged at any angle, thereby assuring an easy selection of the particular bur required.

A TOOTH BRUSH AND CASE.

Presented by Dr. Cochran of Chicago.

Two styles are furnished—hard rubber case and glass case. The brush has a rubber shield which fits tightly around the handle just below the bristles and when inserted into the case, which acts as a receptacle for an antiseptic fluid, prevents leakage. This case is a splendid device for keeping the brush clean and sterile.

COKE'S PLASTIC FILLING INSTRUMENTS.

Furnished by the manufacturer in sets of six in rubber handles. Each instrument has a double working end. The shape and angle suggest them as being very adaptable for the purpose for which they were designed.

AN OBTUNDING SYRINGE.

Invented by Dr. J. B. Sapp of Cleveland, Ohio.

The object to be attained by the use of this instrument is to anæsthetize the tooth pulp by injecting into the dentine a minute quantity of cocaine, or other anæsthetizing agent. The theory is that the anæsthetic (by the high pressure exerted thereon) is forced through the tubuli into the pulp, anæsthetizing the same, enabling the dentist to excavate decay, or extirpate the pulp without pain.

By the extreme sensitiveness of the thumb-screw the operator can tell exactly how much pressure to apply, and knows instantly when the full amount of pressure is being brought to bear upon the tooth.

A PLASTIC IMPRESSION RUBBER.

This rubber is strong and durable. It will not scale or irritate the mucous membrane. It takes an accurate impression. Its use is for fitting plates that are from any cause a misfit. This material seems to answer the purpose for which it is intended and no doubt will fill a long felt want.

A NITROUS OXIDE BLOW PIPE.

Presented by L. J. Mason & Co.

This blow pipe is similar in form to the one previously presented by this firm, with the exception of a new arrangement for directing a small flame upon the yoke, thereby preventing freezing of the gas and subsequent stoppage of flow.

THE GRISWOLD STERLIZING TRAY.

Invented by Dr. Griswold of Chicago.

A splendid adjunct to the operating table—a tray made of heavy plate steel, double coated with white porcelain. The edge is corrugated, which permits of the laying of instruments with working ends toward the center, or extended away from the tray. It answers the purpose of a sterilizer in that it may be partially filled with water and with the instruments inverted it will sterilize the points and shanks, when placed over a flame. It is not easily stained with drugs and prevents rolling off of the instruments.

ROACH'S PLASTIC PORCELAIN.

Invented by Dr. F. E. Roach.

A new porcelain of great strength, its principal distinctive feature being that it may be molded in the cavity. No matrix need be used. It is composed of a powder and a liquid which is mixed about as cement, care being necessary to spatulate well, and when worked in the hand to the consistency of putty, it is pressed into the cavity model, and while it is crystallizing it may be carved or formed to any desired shape. It is opaque and very strong. Its principal indications are in large restorations in the molars, badly broken roots, and adapting porcelain crowns to roots. Fuses at about 1600°. May be furnished in a variety of colors.

THE NEW SANITUBE.

Presented by the Sanitube Company, DesMoines. Iowa.

A sanitary saliva tube which has the regulation curved glass ejector tube, with removable soft rubber tip. Both the tube and tip are interchangeable. The tube may be made absolutely sterile. Being open at the end, it may be freed from all debris and disinfected. The soft rubber tip has holes in it which have thin edges which render them pliable and non-irritating to the mucous membrane. This tube has many advantages over the ordinary non-cleansable tube.

DR. AMES' BERYLITE PLASTIC CEMENT.

An alumnia silica phosphate cement. Judging from texture and tests out of mouth, seems to give promise.

THE IMPERIAL COLUMBIA DENTAL CHAIR.

Presented by the Ritter Dental Manufacturing Company.

Imperial Columbia Dental Chair, with several new and useful features, viz., the compensating back, which is so adjusted that no matter what position the back is in the head of the patient always remains in the head rest. The child's seat combination in the back of chair brings the head of the smallest patient as high as that of a grown person, giving a perfect adjustment of head rest and arms. It has rubber in the footrest instead of carpet. Friction devices are employed throughout, making the adjustment of all movements easy.

THE OLIVAN PLATE SWAGER.

Presented by the International Dental Manufacturing Company, Toronto, Canada.

An apparatus for swaging metal base plates over a metal model. It would take too much space to even vaguely describe this apparatus. But mention of it should be made because of its splendid merits.

THE HANSON HANDY HOLDER.

Presented by the Sibley Dental Supply Company and invented by Dr. H. J. Hanson.

A clamp so constructed that a small square of rubber dam may be stretched upon it and when adjusted on a tooth it forms a cup-shaped arrangement, inclosing the tooth crown. Clamps are furnished for the bicuspids and molars. Your committee feels justified in recommending this very ingenious and useful appliance.

ROOT FACER.

Presented by the Sibley Dental Supply Company.

A splendid arrangement for facing roots. It has the following good features:

1st. One facer will prepare any sized root. 2d. Being thicker through the center than at the periphery, it has a tendency to displace tissue instead of cutting it as in other facers. These facers are furnished for the right angle and straight hand pieces.

The Randall Faichney Company of Boston, Mass., present the following new forms in dental syringes:

1. The Harvard All Metal Syringe. 2. Dental Sub-Q Abscess Syringe (all glass). 3. Imperial Hypodermic Syringe (all metal). 4. An interchangeable barrel syringe. 5. Harvard Solid Metal Self-Filling Syringe. 6. Imperial Dental Needles.

The above goods represent the most modern and reliable forms of syringes and should appeal to every dentist as such. The Imperial Dental Syringe has some splendid features in that it is all metal and has large end on the plunger which overcomes the possibility of cutting the hand. The needles have razor edges and do not tear the tissue, but cut it when forced into position for injecting.

RIGHT ANGLE PLUGGER.

Invented by Dr. Wimmer of Chicago.

It is so constructed that the blow is delivered at right angles to the long axis of the plugger. It seems to be an ideal instrument for use in posterior cavities.

A PIN EXTRACTING INSTRUMENT.

Invented by Geo. T. Carpenter of Chicago.

A splendid and compact instrument for extracting broken off pins in roots of teeth, a full description of which your committee was not able to obtain.

The Dental Protective Supply Company presents the following new appliances:

THE FELLOWSHIP NEW PROCESS TEETH, FELLOWSHIP FUSIBLE FILLING MATERIAL, AND FELLOWSHIP OPAQUE PORCELAIN.

The description of the above goods was received too late to incorporate in this report.

NITROUS OXIDE BLOW PIPE AND BUNSEN BURNER.

Invented by Dr. W. H. Taggart of Chicago.

Your committee was not able to obtain a description of the above invention.

NEW TOOTH FORM AND METHOD.

By Dr. B. J. Cigrand, Chicago.

Report received by vote of society.

OUR YOUNGER PATIENTS.*

BY GRAFTON MUNROE, D. D. S., SPRINGFIELD, ILL.

There is no other class of patients that calls forth such a varied degree of careful handling and perhaps so great a degree of tact, as do the children between the ages of 3 and 10. I say 10, because then the child has passed the time for the eruption and the calcification complete, of the first molar, it being the tooth which decides the mesio-distal relations of the jaws, and hence this is a very important period. Much depends upon the whims of the children, but carefully approached by the dentist it is often possible to do for them even to the surprise of the parents.

When the little ones are brought to us with teeth showing great carious cavities, and exposed or aching pulps, we are inclined to think that the care of the child's teeth should begin with as early a period as the conception of the mother. In this day of the strenuous life too little care is given during the period of gestation to the conditions which make for the best development of the fetus, and to the proper selection of food which would furnish materials for the building of strong dentures. This, however, would not suffice, for strong teeth placed in bad or unwholesome environment would soon succumb to the ravages of decay, as is often seen in the mouths of children born of robust and healthy parents.

---

* Read before the Illinois State Dental Society, May, 1906.

Eternal vigilance is the price of good teeth, and hence we should be guided to the adoption of the best prophylactic measures that can be found. Three years of age is not too young to instruct in the handling of the tooth-brush, and with an agreeable powder or wash it becomes a delight to the little ones, and soon as much of a necessity as the hair brush.

The responsibility that rests upon parents, especially mothers, along these lines of proplylaxis is only equaled by the caution which should be observed in the conversations expressing the terrors and dread of a visit to the dentist. Many times the little ones approach us with fear and trembling, produced by no other cause than what has been brought to their ears through the rehearsal by some relative or friend of their experiences in the dental chair.

The deplorable ignorance shown by many mothers of the number of teeth which should constitute the first set is often responsible for the awful ravages of decay, which has had full sway in the child's mouth, the mother being content with the idea that the first molars will be shed and need no care until the pangs of toothache and the distress of sleepless nights drives them to the dentist. Right here, and along this line, is where we as dentists in our several communities could accomplish much good by getting before the teachers and then in the schools before the pupils the knowledge of the teeth by lantern talks or chalk talks, and plain statements of unscientific nature, not full of hard technicalities, acquainting the children with the names of the teeth and their positions and numbers, as well as giving them ideas of the proper cleansing of the teeth.

A tooth-brush drill might be added to the calesthenic drills common to many departments of our schools, and would stir up an interest because novel. Some time ago your essayist understood that a pamphlet containing important items concerning the teeth and their care was to be gotten out by this society, and the members supplied with a stock so they could be used among our patients, with the compliments of the society, thereby aiding in the dissemination of knowledge of the teeth without the seeming advertisement of any one practitioner. The idea appealed to me very forcibly, and I would be glad if such a plan could be revived and put into execution. I do not think it is too Utopian to say that the day is not so far distant when the children in our public schools will have to submit to an examination of their teeth each year before entering the schools, either by a dentist or by a capable teacher, with a chart for the recording of those cases where the teeth show a certain amount of caries. This prophylactic measure being adopted, it would lessen the causes for the vitiation of the atmosphere of many of the school rooms where our children spend many hours, and likewise render the spread of infectious diseases less likely. Once in the office, the first and most important thing to do is to gain the confidence of the child, and that must be done at the expense of some loss of time, if necessary. If it is possible to get the parent's help, do so, but if developments show that the dentist should be entirely the master of the situation, then ask the parent to retire, with the assurance that the child shall receive only the best care. Your conscientious efforts may, however, not suit the little patient, and you may find the next appointed time not kept. The method of dealing with these younger patients at their first experience in a dental chair must be accompanied with much tact and kindness. Superficial work could be done at first sitting, and by no means undertake anything heroic unless it is absolutely unavoidable. For instance, it is not wise to introduce yourself to your little patient with any other than smiles, and the undertaking of the treatment of an exposed pulp with pressure anæsthesia at the first sitting might prove disastrous to your welfare and destroy the confidence so much desired. In the care of the temporary teeth many ideas have been advanced as to the use of different materials. Extremists advocate the use of gold, but in my hands I have had the greatest satisfaction in the use of pink gutta percha of the base plate style, not the stopping sold in boxes.

The next and perhaps the most lasting material used, but by no means the most pleasing to the patients, is the oxyphosphate of copper. Its tenacity is remarkable under adverse circumstances, and but for its color would be very popular. A varying degree of success has been attained in the use of amalgam, but chiefly in smallest cavities; a cement and amalgam makes a plastic next in tenacity to the copper cement.

The filling of the temporary teeth is not so serious a problem as the treatment of them when largely carious, coming as they do with large cavities in the molars. It is often a question of how to do away with the gum boils, and the putrescent conditions which have caused these troubles. In my hands the most satisfactory remedy is a solvent or digestant, manufactured by a reliable firm, not commonly accepted as a proprietary medicine, known as Caroid Solvent—a permanent solution of vegetable proteolytic ferment. Following the use of this, and at intervals of several days, while sealed in the cavity, the tooth may be filled, but it is often well to give a vent by puncturing the tooth on the buccal surface. Should our efforts fail after this procedure, rather than extraction of the tooth, it is often desirable to remove all the crown portion with bur and allow the roots to remain, thereby preserving the space until the permanent tooth is due to erupt; thus we prevent the crowding of food into a cavity which we could not fill, and give a cleaner condition than would be obtained if the crown were left. There is an endless amount of good that the conscientious dentist can do along the line of instruction to our younger patients and their parents in regard to the premature extraction of the temporary teeth. Pages have been written for and read before dental conventions, and many models have been shown giving evidence of the havoc wrought by the premature extraction of the tooth of which I have spoken as so important at the beginning of this paper—namely, the first molar.

The important question is, Do we sufficiently impress upon our younger patients and their parents the importance of preserving these early members of their dental armament? What practitioner among us has not been frequently appalled by the carious condition of the first permanent molar, and how often it happens that the parents are not aware that this tooth belongs to the permanent set? Some of the difficulties in the handling of children needing care of these teeth severely try our professional skill and patience, and we might well stop here to consider for a little this familiar subject.

Erupting at a time when the mouth is often a hotbed propagating the germs so active in the destruction of tooth structure, there is little wonder that this first permanent molar suffers extensively. When we consider the importance of the thorough calcification of this tooth and its roots, and the fact that this process is not completed much before the tenth year of age, the question of the proper material for filling is a serious one.

The position which this tooth occupies in the arch is one of the first elements which enters into the consideration of diagnosis in orthondontia. It has practically supplanted the cuspid, which used to be considered the keystone of the arch, as it is erupted so much earlier and upon its normal mesio-distal relations so much depends for the development of a normal and beautiful occlusion. We are often appealed to when the child is at this age to give attention to the correction of little existing irregularities, and the conditions or causes which produced the irregularity must be considered. Among these are the health of the child—nasal obstructions, excessive amount of caries, etc. Of course, the orthodontist meets with many cases where the anterior teeth are in malocclusion, even when the molars referred to are in proper relation, and much more propitious is the start with a normal mesio-distal relation of these teeth.

For a long time the existence of malocclusion of deciduous teeth was a matter of very little prominence, but since orthodontia has assumed its position of importance as a specialty in the practice of dentistry, attention to this condition has been such as to bring forth the belief, and statistics to verify, that malocclusion of the deciduous teeth is a condition of almost alarming prevalence. This warrants us in the belief that it is as much our duty to study the malocclusion of the deciduous aeeth and, as a sequence, the effect upon the permanenth teeth from a lack of care for the deciduous ones, as it is for us to suggest the correction of irregularities in the permanent ones. Often the irregularity of the deciduous teeth may be corrected or materially helped without elaborately constructed fixtures on both jaws—making the lower jaw act as a splint and by gradual expansion of this jaw acquire a like expansion of the upper. We practitioners of this day and generation can therefore congratulate ourselves that we live at a time when the ranks of our profession are receiving men who are acquainted with true orthondontic principles, and the formerly common advice given by dentists to parents, to let the teeth alone and nature will bring about a correction of the irregularity, becomes only the excuse of incompetence. One of the most frequent expressions met with in daily practice is that which tells of the regret that parents did not give attention to the children's teeth early in life. Hence it is all the more imperative that we should be well equipped to meet the needs of our younger patients. The colleges in their special and post-graduate courses are meeting the needs along these lines, and orthodontia is given far greater attention now than in years past.

Specially commendable are the efforts that are being made by unselfish men and men versatile in genius—foremost among whom is one whose name is always associated with orthodontia—in the establishment of schools of orthodontia, where the cardinal principles are taught and methods for practice are reduced to such simplicity that even the country dentist may be a builder of fine faces out of direful irregularities. Such is my belief in the importance of the dissemination of knowledge of orthodontic principles that I would not relegate it to the hands exclusively of a specialist in large cities, but believe it should be a part, and a very important part, of the knowledge possessed by the general practitioner to help him practice more intelligently and for the greatest good to the greatest number. Few communities where the population is less than one hundred thousand would support a dentist giving his entire time and attention to orthodontia as a specialty; and the thought that a large majority of cases could be sent or referred to the city specialist should not be cherished, but the dental practitioner could and should fit himself for meeting these cases with the knowledge now placed within his reach by the schools giving good post-graduate courses, and the selection of some system that shall be marked by simplicity. Were these means for the spread of orthodontic principles properly appreciated, we would not hear so much about the extraction of the first molar, the premature extraction of deciduous teeth, the correction of irregularities in children needing the removal of nasal obstructions, of the correction of the malposition of a single tooth when the whole condition of malocclusion should be taken in consideration.

The plea that your essayist would set forth is this: Study to make your practice reach out for the greatest good to the greatest number. We can not all be eminent in our profession, but we can be above the average. If we are to be content in using only gold fillings and never to strive to obtain results worthy of our calling as modern dentists in the developing of our skill in the use of porcelain; if we intend to extract teeth and content ourselves with thus relieving crowded conditions of the jaws because a specialist in orthodontia is not close at hand or available by the patient's pocketbook—for you know it means much to have to go to another city for such attention—our spheres of usefulness will be very limited. To be sure the field of dentistry is widening each year, and we see the need of attention in special lines, beginning with our younger patients and on to the ones of advanced life, but in the large majority of towns and cities of fair population, to devote one's entire energies to a special branch, such as extraction of teeth, construction of artificial dentures and bridge work, manipulation of porcelain and exclusively operative work, or the correction of irregularities that we would gladly give our care, would rob us of much of that development of skill which comes from giving to our energies a wider range and which under proper study and guidance has brought many of our own society members into spheres of usefulness they would not have attained as specialists.

PROCEEDINGS OF SOCIETIES.

ODONTOLOGICAL SOCIETY OF CHICAGO.

A regular meeting was held January 9, 1906, with the president, Dr. J. E. Hinkins, in the chair.

Preparatory to the reading of the paper of the evening, Dr. Truman W. Brophy exhibited a case of phosphorus necrosis.

Dr. H. L. Lewis then read a paper entitled "The X-Ray in Its Application to Dentistry."

DISCUSSION.

DR. J. H. WOOLLEY:

Mr. President and Gentlemen: Dr. Lewis has shown us that in the use of the x-ray our diagnosis is more reliable in many obscure cases of dental irritation than in any other form of diagnosis.

Such has been my experience and I could cite many cases to the support of this claim. One case in particular which was of much interest to me was a lady who for six weeks had suffered from pains in the right superior maxillary bone, reflexing to the 5th pair of nerves, thence to the auditory passages of the right ear.

A skiagraph was taken of the area of the bone situated around the right upper first bicuspid roots, extending to the second molar, a diseased condition was found, and after surgical and antiseptic treatment the patient was dismissed cured.

To conclude I will say, the more we familiarize ourselves with this special science the more reliable will our diagnosis be.

Dr. Lewis has made a valuable contribution to our dental literature and to our society as well, for which we tender him our thanks.

DR. TRUMAN W. BROPHY:

The value of this paper will not be transient, but enduring. After passing around a note to everybody here asking the question as to what the profession most needs, I made a note on the subject of the x-ray, because I feel that the paper presented by Dr. Lewis will stimulate in us a stronger desire to become better acquainted with the value of the x-ray and to employ it more.

Dr. Lewis has gone over the ground very fully and pointed out to us the value of the x-ray and its uses in different conditions, all of which I recognize as valuable, because I have employed the x-ray in many of them. I have further employed it as a means of diagnosis in other conditions than those he has mentioned. Its value in the special conditions I may say, of the mouth, is beyond calculation, because with it we are able to see that which we presume exists, and to settle beyond the question of doubt the extent of an abnormality, provided that abnormality be of a bone or of the teeth.

You will all have an opportunity to see in a few days the result of Dr. Lewis' work in the skiagraphs that he will make of the case of the young girl I exhibited this evening, who is the victim of phosphorus poisoning. You will see beautifully outlined by his skiagraphs, I am sure, the area of the necrotic tissue.

A knowledge of the x-ray is of inestimable value preceding operation. It is true, when we know our duty, when it is clearly outlined, when we know that surgical interference is the only possible means by which we may relieve the patient and restore her to health, it is far more satisfactory to know just how far it is necessary to go in the elimination of a diseased part. So, instead of finding it necessary, as we may do in certain cases, to remove a third or one-half, or in extreme cases the whole bone, by securing a good x-ray picture of the parts, we locate it, and we say we will go so far and no farther, before the operation begins. I regard that of very great value.

Two years ago I had occasion to treat for the first time a case of ankylosis of the temporo-maxillary articulation in a man, 45 years of age, whose mouth had been closed for twenty-five years. Arthritis followed an attack of typhoid fever, and the arthritis was followed by complete ankylosis of the left maxillary bone. Prior to my seeing the patient an operation had been made for the purpose of correcting the ankylosis, but which resulted unsatisfactorily. It had not only become absolutely fixed by the infiltration of osseous material and the complete development of bone about it, but it extended down so far that I deemed another operation in that locality inexpedient. This was determined by means of a skiagraph. Had it not been for the skiagraph I would have operated in the same place. I made another operation farther down, which was a success.

In another case, in which the malar process was involved, a mass of bone extended an inch and a half below the end of the condyle. The skiagraph made it possible for me to do what was necessary, otherwise I might have made a mistake in making an operation.

As a means of diagnosis in tumors and diseases of the antrum, as the Doctor has pointed out, it is very valuable. It is likewise valuable in all morbid conditions which particularly involve the bones.

I am satisfied in regard to the care of roots of teeth, if we are in doubt in cases of this kind, where we have had experience in working into the canals and could not do it satisfactorily, if a skiagraph is made, we could determine what is the matter. We may have a root at right angles. If so, a skiagraph will tell us; we can not tell by feeling.

So in orthodontia, there is not anything that has come to these specialists as an auxiliary in carrying out their work that can be compared in value with the x-ray.

Dr. J. G. Reid:

I do not know anything about the x-ray except the pictures or skiagraphs I have seen. They reveal some very peculiar conditions, morbid conditions about the jaw, and it struck me that one of the most applicable places where the x-ray might be used to advantage, and which was referred to in the paper, is in locating sinuses, associated with an abscess, somewhere in the mouth, and I will just relate this incident, which occurred a few weeks ago in my office.

In trying to locate the tooth that was involved in the trouble the sinus opened on the lingual surface of a third molar upper right side. The third molar was a healthy, normal tooth. The first molar, second molar, and the second bicuspid were pulpless, with mush-bite crowns on two molars. It was hard for me to locate which one of the three teeth the abscess was associated with; whether it was the first or second molar, or the second bicuspid. The first bicuspid was absent. So I treated the second bicuspid, and I determined that the sinus was not connected with that tooth, showing I was mistaken eventually. I removed the mush-bite crowns successively, and I found that they were pulpless, with no effort having been made to remove the contents of the canals of either one of them. So I began to try and find where this abscess was, and I could not locate it in the second molar, nor in the first molar, and I eventually got back to the second bicuspid, and after repeated efforts, and a long time of worry and trouble and annoyance to determine where this abscess was, I finally located it, and found it was associated with the second bicuspid. The sinus opened on the lingual surface of a third molar. I could see very readily in this instance how I might have been relieved of great annoyance and the patient of much trouble had I use of the x-ray as an aid in determining where this abscess was and where this sinus led to.

This paper reminded me of this case, which annoyed me very much, and it would have annoyed anyone to have treated the case as it was. I eventually effected a cure. The x-ray can be utilized many times, and especially in such cases as that, and I am very much gratified to have been here and heard this excellent paper. I think it is a valuable contribution. He has gone over the details of the subject so well that it is understandable by all of us. The advantages that can be gained by the use of the skiagraph in the hands of a man who knows how to handle the apparatus, who is familiar with the details of the work set forth in this paper, can hardly be estimated.

Dr. J. N. Macdowell:

Mr. Chairman and Gentlemen—I assure you it is a great pleasure to be here this evening and to have the privilege of hearing this very interesting paper. It has been very interesting to me, because Dr. Lewis has enumerated a great many difficulties and conditions that will be encountered in using the x-ray or skiagraphs as a means of diagnosis.

About thirteen years ago, I believe, there was a man in Europe who discovered this wonderful ray, and as he did not know what it was he called it "x-ray," "x" being the algebraic symbol for unknown. At the present time we know a great deal more about it, and we have applied it to almost every branch of science with wonderful results. It is true there was no one, until recently, who was competent to take up this x-ray work, in its application to dentistry, consequently it has not been used as an aid to diagnosis in our work as frequently as it might have been.

Shortly after I graduated, or even before, I saw the possibilities of x-ray in dentistry. After I graduated, as soon as I had a case on which I could use the x-ray, I immediately took it over to the x-ray laboratory, which was then conducted by Professor Fuchs, and I found that Dr. Case had preceded me by two or three other cases, and, so far as I know, Dr. Case was one of the first in dentistry to utilize the x-ray for dental work. Well, cases were coming in constantly, especially in college work. I took a great many of these cases to the laboratory for the purpose of having skiagraphs made. Many of them were failures at that time, because the cases were either over or underexposed, and there was nothing but a white, clouded picture, which afforded no detail.

About eight years ago I spent considerable time with Mr. Fuchs in studying the application of the x-ray in dentistry, and we were able to get better skiagraphs than we had done before. I have brought along two out of a great many cases to show you with what clearness conditions can be brought out by this working together. X-ray work is very complicated. It will not do for any of you to send a case to the laboratory, have an x-ray taken, and expect good results. You must go there yourselves and work with the x-ray man.

I am glad Dr. Lewis has taken up this work in a scientific and systematic manner, and nothing will be accomplished unless it is done in that way.

I took a number of skiagraphs of cases which covered, as I thought, every portion of orthodontia, and classified them. I had skiagraphs made of missing teeth, of tardy erupting teeth, of malformed teeth, of supernumerary teeth, etc. I wrote a paper on this subject, which was published in THE DENTAL REVIEW.

Some years ago I brought out another phase of the subject, and I am very sorry I did not have time to bring the skiagraphs here this evening, which I have at my home. Had I received the invitation in time I would have done so. I presume Dr. Lewis knows all about it. I refer to the use of the stereoscope, taking two pictures of the same case. I wrote a paper on this subject, which also was published in THE DENTAL REVIEW. Of course, it makes it much more interesting to have two skiagraphs rather than one. Then, by using the stereoscope, one is enabled to see into the bone, around and behind teeth. Take the hand, for instance, in which there is a foreign body embedded, shot or a needle, one can determine its exact location readily by the aid of two skiagraphs and the stereoscope.

A few years ago I carried on a number of experiments, some of which were published and some were not. One of the most interesting experiments I carried on was in regard to the movement of the lower jaw. First, I attempted taking a skiagraph of the glenoid fossa of the lower jaw. Before the backward movement had been accomplished then it was my intention to take another skiagraph after the movement. In taking these skiagraphs I found that I had cloudy pictures, for the reason that there are too many bones intervening between the glenoid fossa on the right side and the other side where the plate was placed; consequently some method must be found out whereby we can take one glenoid fossa only. I hope Dr. Lewis will experiment along that line. I think something might be accomplished by holding the plates in different positions.

Another experiment was that of extracting the first bicuspid, then putting on a traction screw to draw the cuspid back, then taking the patient over to the laboratory and having an x-ray taken, and then six or eight weeks after, when the tooth was drawn back, taking another picture. I then have two pictures of the case, one before and the other after treatment. In one of them you can see where a change has taken place. In the first the lateral is overlapping. In the second the cuspid tooth has been drawn back and the lateral is separated from the central a millimeter and a half, due to the strong tension of the peridental fibers passing from one tooth to another in the gingival portion.

Here is a skiagraph of the lower first molar, showing a large cavity in it. This is from my own mouth. When I was a student in a dental college I was persuaded to have a large amalgam filling taken out and a gold filling was to be put in its place. After a student had removed the amalgam filling the tooth began to ache, which lasted four days. The pulp was devitalized, and before the case was completed the student died. Another student took hold of the case, but he was taken sick and another took charge of the case, so that three different students worked on the tooth. One student broke off a Gates' drill in the tooth and the last man lost one or two broaches, but finally the tooth was filled. Three or four years after this the tooth troubled me a great deal. Several dentists worked over it. They opened it up to the apex, as they thought, and put in a treatment; the first time I went home perfectly satisfied. The tooth ceased to pain me for two weeks then pained again, but every time they applied a treatment the pain would stop for several days. Finally it got so bad that I had an x-ray taken, then had the tooth extracted. I found this: The dentists had drilled down about half way through the root and left the other one-quarter of the root filling there; yet they managed to pack medicine on top of the root filling, and I imagined that the medicine reached the seat of the pain. I found they had not gone through the root filling, and the root filling did not penetrate to the apex of the root. I also found this, that the last student who had filled it in college had made a nice little hole through the distal surface and packed this with a filling which shows plainly on the skiagraph.

Here is another very interesting case of a boy, 12 years of age, who was sent to me for advice. In this case the central and lateral are missing. On questioning the parent I found the boy, when a child, had fallen from a chair and struck his front teeth on the edge of a stove. All the temporary teeth were knocked out of the alveolar process. I had a skiagraph taken of the case. The skiagraph shows the lateral is split half way up and that the central incisor is also shattered. He will undoubtedly never have his permanent lateral or central incisor.

Dr. Geo. W. Cook:

I must confess my ignorance of this subject, although I was probably among the first to attempt to do x-ray work. One of these apparatuses was installed at the Mercy Hospital, when Dr. Dorr was doing some x-ray work there with the x-ray very early in the introduction of it into this city, and I then thought I could see great possibilities from its use in dentistry, and with the assistance of Dr. Dorr I attempted to do some x-ray work, but I found it was attended with difficulties. Some of those difficulties have been enumerated this evening, both by the essayist and by Dr. Macdowell. I was unable to detect these root fillings and to determine exactly their location, and as to whether I had properly filled the root canals or not. Of course, I early thought the x-ray would be a great benefit, and I can see now that a lack of knowledge in manipulating the instruments was one of the great obstacles in accomplishing anything in this work. It seemed to me then that we could not properly locate the films for taking x-ray pictures of the mouth, and Dr. Dorr was not an expert in the manipulation of the instrument, and I knew very little about photography. We did, however, manage to make some x-ray pictures of impacted third molars that were subsequently treated with beneficial results. I do not believe it would be practical for dentists to have x-ray outfits in their offices and do their own work unless they have more time than most dentists. This x-ray work requires a great deal of attention to details, a great deal of knowledge, which can only be acquired by the actual use of the instrument.

I don't know whether my eyesight is bad, or my conception of diseased tissue is bad, but I have never yet seen an x-ray picture in which I felt sure of the difference between diseased tissue and sound tissue. I have looked at pus cavities in bone, in the alveolar process, in the abdomen, and in other locations of the body, and I must say I have been at a great loss to say which was diseased tissue and which was not. Of course, this may be due to my lack of perception to differentiate between diseased and sound or normal tissue. In cases of inflammation, infiltration, or in the stages of hyperemia, I think sometimes we are able to detect some difference; but I do not think we can tell exactly where to cut and where not to cut. If we could know exactly the line of demarkation, so to speak, between tissues that we should remove, and those which we should not remove, by means of the x-ray, it would be a valuable adjunct.

Dr. E. J. Perry:

I know very little practically about the x-ray or skiagraphs. I feel that a knowledge of the use of the x-ray and a knowledge of its possibilities to us as dentists should be possessed by each one of us; therefore the paper is of great value, and when it shall have been published and we shall have had a chance to study its various propositions, much of it will come back to us with much more force than it would from one reading.

I am sure that if I could have availed myself of the x-ray in at least four cases in my practice I would have saved the patients' lives. I have had in my dental experience three cases of ticdouloureux, and each of those patients died from diseases which were superinduced, I presume, by the loss of power incident to the suffering from the ticdouloureux. Since I have had any knowledge of skiagraphy I have always thought that the x-ray, if it had been used in these cases, might have revealed the cause of this terrible disease. If any of you have had any experience with cases of ticdouloureux you will recall that these patients suffer beyond the possibility of description. Distinctively, there is a peculiar character to the paroxysms of pain.

My first patient was seized with a paroxysmal pain when walking along the street and had to grasp a lamppost to prevent her from being thrown violently to the sidewalk.

Another case I had jointly with Dr. Brophy. This was a case of antrum trouble. The patient had been treated by a specialist in medicine, not a dental specialist, who opened into the antrum and put into the opening a German silver tube without any flange on it. This German silver tube, as the patient informed me afterward, was lost. She never knew where it went to, but supposed she lost it in the bed or some place. I examined her mouth carefully. She had been treated for nine months and I found the only tooth in her mouth on that side was a lateral incisor. Dr. Brophy and I opened into that tooth and found it was pulpless and that the root had not been filled. The tooth was sound apparently, but no attempt had been made to fill the root, and inasmuch as the specialist said there were no pulpless teeth in that side of the mouth I made up my mind that that probably was because of the trouble. Beyond the question of doubt pus burrowed from the lateral incisor into the antrum and was the primary cause of the trouble. Dr. Brophy opened in there, enlarged the opening, but we did not take an x-ray picture of the case. We treated that case with everything. I think Dr. Brophy even used sea water, but could not make it heal. We therefore extracted the lateral incisor because of the condition the patient was in. Shortly after that she went to Minneapolis and was seized with acute symptoms again, and fell into the hands of Dr. Peck. Dr. Peck, not knowing what to do, took her to a celebrated surgeon of the University of Minnesota, Dr. Herrick, who made an x-ray of her jaw and found or located the long lost German silver tube, standing upright at the rear end of the antrum. Dr. Brophy and I had never suspected the presence of any metallic substance in the antrum. Dr. Brophy did, however, take out almost a handful of antiseptic gauze. If an x-ray picture had been taken early in this case, or if either Dr. Brophy or I had suggested such a thing, that woman might have been saved much suffering. Or, if the surgeon, in the first instance, had darkened his room and taken his electric light, as Dr. Brophy did, and found a pulpless tooth, and had known that 95 per cent of the cases of antrum troubles arise from pulpless teeth, his suspicions would have been directed toward the lateral incisor and he would have sent the patient to a dentist to have that tooth treated. This woman was almost treated into her grave, so to speak. I have not seen her for several years; she is very much impaired in health, and is today a physical wreck.

Now, it is possible that the use of the x-ray would have saved that woman much pain and annoyance, and it is also possible that with it the cause of the ticdouloureux in the three cases I have mentioned might have been located.

I wish to thank the essayist for his admirable paper.

DR. S. W. FAHRNEY:

When I graduated from high school it was necessary for me to deliver an oration, the subject of which was the x-ray. But little did I appreciate the value of the new discovery and not until my professional career commenced was the importance of the subject realized.

In the year 1898, when I entered the Chicago College of Dental Surgery, Dr. Case was using x-ray skiagraphs in his practice to aid in diagnosis and to determine the exact positions of impacted teeth.

Being closely associated with Dr. Case as his assistant, both in his private practice and in college work, it has been my good fortune to have the opportunity of seeing a great many cases during the last seven years in which the x-ray has been used very successfully.

Orthodontia being my specialty, it is the only branch of dentistry in which I have had occasion to determine the usefulness of the x-ray. But I am pleased to say with authority that any person who wishes to determine the possible presence of an impacted tooth will find the use of the x-ray invaluable.

In most cases of delayed eruption of one or more teeth the cause for the space in the arch remaining unfilled will generally be clearly shown by a skiagraph. Sometimes several supernumerary teeth are crowded together, preventing the eruption of the normal tooth. In other cases the tooth has been found with its central axis almost at a right angle to its normal position.

By the use of the skiagraph an absolutely correct diagnosis of such cases is obtained and correction is a matter of certainty.

Very often cases are presented to the dentist for examination in which one or both upper permanent cuspids are lacking in the arch. In some of these cases the patients may be absolutely sure the missing permanent tooth has been extracted. But it is not good policy to take the patient's word as proof in such cases, for often have I seen deciduous cuspids nearly the same size, shape and general appearance of a permanent cuspid. A dentist could tell the difference, but the patient might be deceived. Therefore the extracted tooth the patient thought was a permanent one might have been the deciduous tooth, and very often the skiagraph has showed the unerupted permanent cuspid, the eruption of which had been delayed for some reason. The overlying tissue does not always show the presence of an unerupted tooth and if it does it is sometimes impossible to ascertain the exact position of the tooth. This certainly can not be accomplished by a better method than with the skiagraph.

In making a diagnosis every dentist appreciates the importance of being able to prove the diagnosis correct. The patient has a higher regard for the man who can prove his plans are founded upon scientific evidence. I am sure that in my own practice the x-ray has been a great aid to me in this way and consequently I have secured cases I would not have obtained had it not been for a skiagraph.

I wish to thank Dr. Lewis for his excellent paper. He knows I appreciate his work, because it has aided me greatly.

Dr. C. S. Case:

Realizing that the subject of this paper would be very interesting to orthodontists, I took the liberty of inviting three other specialists in orthodontia here tonight. I appreciate the fact that we have a man who is going to carry out this special field of work, particularly for the benefit of the dentists. It is not only interesting for orthodontists to know that with the x-ray they can discover an impacted tooth, etc., and the cause of it, but the x-ray will be found as an aid in every branch of dentistry.

Those of us who have attended the different dental societies and kept in touch with the literature of skiagraphy are pretty well posted in regard to what may be accomplished along this line; yet there are a great many dentists, and it is surprising to find so many who seem to be perfectly unconscious of the possibilities of this work. Only the other day a dentist came in to ask my advice in regard to a case that he considered quite interesting. It was plainly to be seen that the two central incisors and one lateral incisor were supernumerary teeth. They were quite out of line, and his object was to ask my judgment in regard to moving those teeth into line, that he might cut them off and put on crowns. When I suggested to him the possibility that the perfect teeth were there imbedded and impacted and they might be brought out by removing the teeth, by having a skiagraph taken to show whether they were there or not, he seemed quite surprised. I do not know what he did to the patient, but I have no doubt that beneath the roots of those supernumerary teeth he would find the perfect teeth.

There are quite a number of features in regard to the x-ray which, I think, Dr. Lewis is going to perfect, and one particularly is the shadow distortion of the position of a tooth. The other day Dr. Johnson referred a patient to me and I sent the patient to Dr. Lewis, who made a skiagraph of the case, and I have taken occasion to bring along those skiagraphs to show his method of taking them, which was pleasing to me. The case indicated impaction of cuspids on either side, and he took three skiagraphs, one upon each side, showing an impacted cuspid, and a front view, which was quite desirable under the circumstances, and which gave me a far better relation of the teeth than I otherwise would have obtained.

I have one or two interesting cases here that I would like to present along this line. Out of twenty-six cases which I presented before the Chicago Dental Society, in which there were thirty-nine impactions, there naturally arose quite a number of interesting cases that I have found in my practice within the last five or six years. This one which I hold now in my hand, carries out the thought of shadow distortion of the tooth. One of the skiagraphs was taken from the box, so that it only shows the condition on one side. You will see the cuspid tooth lying at a decided angle, tipped over toward the front, and if you will follow the models along, as the cuspid finally appears, you will find eruption of the cuspids, which were forced out, so that we know now the inclined relation that the skiagraph indicates.

Here is another skiagraph showing the same thing. Here are two cuspids on either side, apparently standing in skiagraph at an angle of 45 degrees. If you will follow along the model you will see the cuspids in perfect relation and in perfect inclination, showing that it would have been impossible to have brought those cuspids in that perfect inclination had they remained in the process, as indicated by the skiagraph.

A great many cases appear to dentists, and being unacquainted with the possibilities of skiagraphy, they wonder why the teeth do not erupt, and out of these cases we have a number.

Here is one of a girl, 14 years of age, who appeared to lack the two central incisors, and although she had been before some good dentists, no one thought of taking a skiagraph. Here are not only the central incisors embedded in the alveolar process, but two impacted supernumerary teeth, preventing the eruption of the central incisors. The supernumerary teeth were removed in this case by Dr. Brophy, and when these models were made the teeth had not been erupted.

Here is one of a boy who lacked a central incisor, and we found two embedded supernumerary teeth preventing the eruption of the central incisor. The supernumerary teeth are there in position.

One of the most interesting conditions to me that can be determined by the use of the x-ray is the presence of odontomata or small tooth globules, evidently of germinal tooth formation, lying in the pathway, preventing the eruption of the proper tooth or teeth. When I first saw the skiagraph there was a slight cloud at the erupting edge of the central incisor. I did not at that time recognize it because I had never seen anything of the kind, knowing I would have to cut down over the tooth and remove all of the superimposed alveolar process to permit the natural eruption of the tooth so far as I could. I went down there and found these odontomata.

In the next case which came after that I recognized a small cloud-like place, which evidently indicated a central incisor that had failed to erupt, in a girl 17 years of age. Immediately I knew it was an odontoma, and without any hesitation I cut down and secured the odontoma which I show you. The tooth at once began to erupt.

I wish to thank Dr. Lewis for his excellent paper, and congratulate the profession on the fact that we have with us a man who is going to take hold of this work in the most scientific manner.

Dr. L. S. Lourie:

I am very much indebted to Dr. Case and to all of you for this very pleasant and instructive evening.

I am pleased with the prospect of our having in Chicago a man who will take enough interest in dental skiagraphs to benefit dentists much more than they have been benefited by their use in the past. In my work the use of the x-ray has been confined largely to locating impacted or delayed teeth. But I should like to have made more use of it. I hope we will be able some day to get skiagraphs that will show us more in detail the structures surrounding the teeth, namely, the peridental membrane and alveolar process. There are a great many problems that occur to me from time to time that I would like to clear up in some way by making records of the progress of cases during treatment. For instance, we might take skiagraphs of cases before, during and after treatment, and in this way have valuable records of the changes that take place in the peridental membrane and alveolar process. A question which causes some so much concern as to whether or not the distal movement of molars may be the cause of impaction of third molars might be cleared up by the aid of the x-ray. As I have said, there are a great many problems that have occurred to me in connection with the use of the x-ray, and I am sure the general dental practitioner has many more, because his field is much larger, and in which x-ray photographs may prove valuable as records as well as aids in diagnosis.

Dr. L. L. Davis:

There was one idea brought out by Dr. Cook, I believe, who said that his eyesight was poor and that was the reason he could not see certain things in these skiagraphs. I think it is possible, with the aid of a specialist, for him to use his eyes to enable him to see correctly so as to make an accurate diagnosis of the case. We have with us tonight a man who is a specialist in medicine who understands the nature of the tissues of which he has taken pictures, who can also inform us as to what these pictures represent. A cloudy appearance in a skiagraph of bone tissue may give us an idea of pus, although it is not clearly outlined in the skiagraph, but his educated eye can help us in making a diagnosis, and so the x-ray is a means toward helping us to understand more thoroughly the case in hand. I have had occasion to use skiagraphy in one or two cases, and in one just recently, in which Dr. Lewis took the pictures for me. This was a case of antral trouble, and the patient was a boy, 16 years of age, who showed no sign of a lateral incisor on the left superior maxilla, and he had been suffering from decided antral trouble for two or three years. There was no indication of trouble along the teeth on that side, because every tooth seemed to be in perfect condition, and I suspected it might be an impacted lateral incisor that had worked its way into the antrum. Here, again, it emphasizes what the essayist has said in regard to the aid that may come from the x-ray expert to the dentist himself; that is, he will help the expert to know just what to expect to find and how and where to look for it. I sent the patient to Dr. Lewis without very much of an introduction, I simply said that I thought there was an impacted tooth present. He skiagraphed along the line where he would expect to find the impacted tooth, but I did not mention antral trouble, so he did not skiagraph the antrum. This shows the necessity of the dentist accompanying the patient to the x-ray expert's office. It is very essential to define clearly what you want the expert to look for. I certainly think this work is going to help all kinds of dental practice, not only in root filling and in impacted teeth, but in any disease we may suspect which may be turned from a possibility or probability into a complete diagnosis.

Dr. C. N Johnson:

I simply wish to add my endorsement to what the other members have said in regard to the value and benefit of this paper, and wish to express my appreciation to Dr. Lewis for having read it. I should like to ask one or two questions which Dr. Lewis can answer in closing the discussion.

First—Whether pulp nodules in sound teeth can be detected by the x-ray with absolute certainty or whether the absence of pulp nodules in sound teeth can be determined?

Second—As to the condition of the pulp in a sound tooth, whether he can determine that it is alive or dead, by means of the x-ray.

There was one specimen passed around showing a broach in the side of a root, and we were told that the other root was filled with gutta percha. I want to acknowledge that, after casual examination, I could not determine the difference between the two, and I would never know if the x-ray was shown me that it was a broach or a gutta percha filling.

I want to ask Dr. Lewis, also, if it is possible to determine definitely whether a canal in an unusual position is filled with gutta percha or not, provided that material is used?

A question I raised at the meeting of the Chicago-Odontographic Society was as to whether it could be determined definitely by the x-ray in a tooth located far back in the lower jaw, where the bony structure is dense and thick, that a broken broach is lodged at a given point in the pulp canal.

Dr. J. E. Hinkins:

I know very little about this question of the use of the x-ray. I thoroughly appreciate, as you all do, the work of Dr. Lewis, also the work that has been done by Professor Fuchs. I have only had one case that I felt it necessary to send to have a skiagraph made, and after we obtained that we were unable to find where a piece of steel was located. In this case an accident had occurred in a steel mill. While grinding with a wheel a piece of steel flew off and penetrated the side of the maxillary bone, and while we could see just where the steel was we could not determine the depth.

Dr. Lewis (closing the discussion):

I wish to thank the members for the pleasure of being with you tonight and for the free discussion you have given my paper. The greatest drawback I have to my research work along dental lines is to find out what the dentists require, and while there are a great many things they can not clear up, such as the proper interpretation of skiagraphs, it is not to be wondered at; it is very much like the use of the microscope. I dare say, while most of us have had a good deal of experience with the microscope we would fail if a specimen or slide was placed before us, in telling what it contained; so it is with the interpretation of skiagraphs, and I can only compare the interpretation of a skiagraph to the use of the microscope. Oftentimes we can not tell why we interpret a shadow correctly, nor why we have a good foundation for interpreting it, except that we can see a pathological change in the tooth structure.

As to the detection of pulp nodules in healthy teeth by means of the x-ray, they can be determined. It is necessary, however, to regulate the vacuum of the tube differently in attempting to discover them, and that is one of the things that makes this work difficult, one has to know the density of the teeth, to know the penetration of the rays, and how best to register that impression upon the sensitive plate. A skiagraph is not merely a shadow, it is the registration of certain rays that penetrate through the tooth. In the penetration of the teeth some rays will pass clear through and make an impression on the sensitive film, while other rays are obstructed and fall flat and make no registration on the film. It is the registration of these rays that penetrate more than a shadow, that you see in the skiagraph. In locating pulp nodules you do so by regulating the tube properly. We would not be able to detect a cement filling, or a rubber filling with the same tube vacuum that we would need to be able to locate a pulp nodule. But if you will look for a pulp nodule it can be found. It may take one or two skiagraphs, but the pulp nodule can be shown.

As to the question with reference to determining whether a pulp is diseased or not, I do not feel competent to answer. While I am not able to tell whether a pulp is diseased or not, the dentist, who is familiar with the anatomy of the teeth and their pathology, should recognize it. I have taken skiagraphs of a number of normal teeth, and I must say there is a difference in appearance in a normal tooth and a diseased tooth that is easily recognized in the skiagraph. In attempting to locate impacted teeth we would not expect to bring out the detail that would show a diseased pulp or a root filling to the best advantage.

As to determining the presence of a broken broach, it is sometimes difficult to determine whether it is a broken broach or whether the dentist has punched a hole through the side of the root and filled it, if you will pardon the use of that expression. You have got to go by the outline in determining whether it is a filling or a broach, a filling would be irregular, while a broach, I understand, would keep its uniform thickness and is apparently square. I do not know that I have ever seen a dentist's broach, but I have a tooth that has a broken broach in it, and the skiagraph shows that piece of broken broach very readily. It shows a clear-cut outline of the edges in contrast to the rounded outline of a filling. In attempting to fill this tooth the dentist ran down into one of the root canals perfectly This root canal bends, while the other root canal runs off at quite an angle, and in attempting to fill it the dentist following the line of the first root went through the side of the root and left the canal entirely unfilled.

This field is but skimmed over. The possibilities of the x-ray are far beyond what any of us appreciates or can even imagine, and I think we will all see its importance and value in dental work. I need the coöperation and assistance of you as dentists in this skiagraphic work. There is no question but that the ideal man to do this work in dentistry is the one who understands dentistry thoroughly, and who can take up this branch, study it and do a great deal of research work.

THE ILLINOIS STATE DENTAL SOCIETY, SPRINGFIELD, MAY 8, 9, 10, 11.

DISCUSSION OF THE PRESIDENT'S ADDRESS.

(SEE PAGE 588, JUNE NUMBER.)

Dr. Cormany and Dr. Brophy being absent, Dr. D. M. Gallie was called upon, and responded as follows:

DR. D. M. GALLIE, Chicago, Ill.:

Mr. President and Members of the Illinois State Dental Society: I was instructed by the Secretary, Dr. MaWhinney, to write out the discussion of the President's address, but as I came last I thought that it would be a waste of time because perhaps I would be only repeating many things already stated by Dr. Brophy and Dr. Cormany, and so I depended upon coming before this society and receiving sufficient inspiration to help me to discuss the splendid paper of the President.

He starts out by congratulating ourselves on the magnificent prosperity of the country. I think we all realize and appreciate the great prosperity and manifold blessings we are now enjoying, and I could not but think how much better off we are in this magnificent commonwealth, where there is no trouble with earthquakes and cyclones, than are our brothers in San Francisco and California. We have reason to be thankful that we are in the great State of Illinois, a State that knows nothing of such upheavals as we have been reading of lately. We should this morning feel very grateful indeed that we are privileged to come here and congratulate one another upon our success and our prosperity, unlike our brothers on the coast, who are meeting and consoling with one another at this time.

The President speaks of the pride he feels in being the President of this great society. I can say that I feel great pride in being a member of a society which has forced upon him the highest office within the organization. He tells us how he appreciates it. I can say that if twenty-five years of activity would have the same effect upon us all that it has had upon Dr. Duncan it is a channel we should all strive and work in, because he comes to us after twenty-five years of activity as young as the youngest. It is the goal that we should all strive for, and if it has the same effect upon us that it has had upon him it certainly is worthy of our greatest effort.

He speaks of those who have gone before. Is there any wonder that today this is the greatest dental society in this great country? When you think of the men who have gone before us, who have set the pace, who have been an example for us younger men to follow, it is no wonder that the Illinois Society is the greatest, because we have had in our ranks the greatest men of the profession.

He speaks of the young men, but it is plain sailing for them because they have the stimulation and the example set them. Indeed, we can all be proud to work with the hope of obtaining the highest position in the profession, because we are surrounded by friends who are all working for the same end, all anxious to uplift the profession and make the best possible out of it.

He speaks of going back to the four days' session. There are many reasons for returning to the four days' session, not so much to meet each other and be friendly and be good fellows, but on account of our great numbers, the greater interest in the society, it takes a greater time to allow all to be heard. It is a source of great satisfaction to know that in this society they are all live ones. Men come here to do things and take part in the transactions, and the result is that we must have four days, and if it keeps on perhaps we will have to increase the time from four days to five days.

He speaks of the law which has been passed, and that we are indebted to Senator Clark. It is a good thing, and we can not bestow too much praise upon him, because in this time of graft and desire to shirk public responsibility the dental profession has to have a safeguard around it, and it is up to us to do our best and show that we are anxious to observe the law and live up to it within our own body, and set an example. So we must not depend upon the Senator Clarks and men who come to the Legislature and make the laws, but we must see that the law is obeyed in our own body, and that we live up to the laws that are laid down, laws that so closely unite us man to man and member to member of the society.

Too much praise can not be given Dr. Black for the splendid work that he has done. We have all worked hard to bring out the splendid results that we see at this time, but if any one man is to receive praise it is Dr. Black, with his splendid idea of organization. His methodical way has made it easy for this society to come out and be the envy of all State societies, and today you hear from the East and West and North and South of State societies that are striving to follow the pace set by this society; but it is a pace that is going to be pretty hard to keep up with because every pace that Illinois sets, no matter whether it is in industry, agriculture, commerce, or in professional work, is a pace that is going to keep them working overtime to keep up with; and so we are proud that we have men that can organize like Dr. Black, and we are also proud that we have men who will follow men like Dr. Black and make the society the envy of the whole country.

Dr. E. Noyes, Chicago, Ill.:

I feel like giving to our President our congratulations, our compliments and our admiration, because of the fact that he is able to say in his annual address that this is the twenty-fifth annual meeting which he has attended. That means that since the beginning of his membership he has not skipped a meeting. There are not many members of the Illinois Dental Society, or any other society, who have so good a record as that. The ones who have we are proud of. We know that they will say that they have had the best of it, and that what they have received has been far greater than what any one man can possibly give. It is a matter for pride and congratulations for both parties.

Dr. C. N. Johnson, Chicago, Ill.:

My only hesitation in arising when called upon was from the fact that I have for the last ten or twelve consecutive years discussed the President's address, and I thought I should give way on this occasion. However, there is just one word that has been suggested to me by Dr. Noyes in regard to faithful attendance at these meetings. I want to congratulate our President upon having attended twenty-five consecutive years. It shows a service of faithfulness to the society that appeals to me and should be emulated by all of the younger members.

Some years ago I was very much impressed by the faithfulness of our old member—Uncle George Cushing. I remember sitting on the council with him just before he left the State, and he informed me that he had attended thirty-five consecutive meetings of this association, from the very first meeting of the organization until he removed from the State. That made such an impression upon me, Mr. President, that I have never forgotten it, and I want to bring that up for the benefit of the younger members who are coming into the association. This wonderful influx that we have in the membership is something that has already been spoken of. Dr. A. D. Black may be eminently proud of all this influx, but it will not bear the entire fruit that it should unless the new membership becomes imbued with the fact that constancy of attendance is an important factor in the future of this organization.

I want to congratulate the President on his address.

Dr. C. R. Taylor, Streator, Ill.:

When I look into the face of our President I can recall the time when he united with this society. It was a good deal hotter week than this week in Springfield. As I remember, it was down in Rock Island, and I never suffered with the heat so much in my life as I did at that place.

I can not help saying that I think Dr. Duncan's goodness and persistency and everything of that kind is largely dependent upon the fact that he lives in the town of Joliet, where everybody has to be good, where it is said that the "pen" is mightier than the sword. But, ladies and gentlemen, better than position, better than honors, is faithfulness. There are several hundred members of this society who can not possibly hope to be President of this great and honorable body, but there is not one among us that may not be worthy to be President, which is better than honor or fame. It is the duty of each one of us day by day to be simply honest, straightforward and perpendicular men in the community in which we live. That is better than to be President or King of any country.

It is the great work of any society not only to fit men to be dentists, but to inspire in them the noble qualities of manhood and virtue and uprightness, and any society that fails to inculcate those principles in its membership fails fundamentally and lastly and everywhere. There is nothing that we have ever seen or touched that we can say is superior to manhood and womanhood when it reaches its highest perfection. We may talk about God, but if we haven't a godlike character in ourselves what does it amount to? If we have got that we have something that will carry us not only through this life but on and on until we can feel and know the supreme and the best. (Applause.)

Dr. C. B. Rohland, Alton, Ill.:

The President congratulated himself upon presiding over the very largest and very best society in the world. That has been the song of the members of this society ever since I have been a member of it, so that it has become a habit. When do you suppose that habit began? Who among all the members here would you say that in proportion to his scholarship and education was the most modest man on the floor? I don't mean myself, now (laughter). Who among all the members here would you naturally suggest as being one of the most modest of men in proportion to his scholarship, a man we all love?

A Voice: G. V. Black.

Dr. Rohland:

Certainly. This is the way it began. Somewhere back in the 70s Dr. Black was president of the society and on retiring from the chair he found occasion to make some remarks, and he thanked them for the honor conferred, and said he felt it to be an especial honor to preside over the largest and best dental society in the world, and from that date it passed into a habit. At that time the society had barely one hundred members, and the average attendance was about thirty or forty, I am quite sure not above that at that time, and yet he speaks of it as the largest and best dental society in the world. What shall we say about it when we have over thirteen hundred members, largely due to the son of the man who made that braggadocio remark—what shall we say of the society now, with over thirteen hundred members and an average attendance probably of five hundred, which we fully expect, and which we had last year? If we had the big head then where will we be now? That is a good habit, however, to have, and don't you know I think the success of this society is attributable largely to that spirit, for in all the thirty-two years I have been a member of this society it has been the habit of members to speak of their society as the very best society going. They always bragged about it, and we finally talked about it so much that we made others believe we were the best society going, and we got the reputation of being not only the best society, but I am afraid the most conceited society too, because I remember that George Edwin Hunt on the floor of this society told us that we were the most conceited society, and there wasn't one that had the sand to get up and dispute it. (Laughter.) It is largely due to such conceit that this society has done the good work it has. It is like a child. If a parent makes the child believe that he is the best and most obedient child around, that child is going to live up to that reputation. On the other hand if he says, "I can't do anything with that kid at all," the child will live up to that reputation. We have given ourselves a reputation and we must live up to it. It is up to those who are now joining us to see that we do make this the very best society in the world. We have the people, we have the ability and we have the energy.

I wanted to draw attention to the gentleman from whom all this spirit of brag started—The very last man in the society that you would think of.

Dr. G. V. Black, Chicago, Ill.:

Mr. President, I don't feel like making any apology for that remark attributed to me. I believe it was a fact then—no brag about it. It has been a fact ever since, and I hope these young men will keep it a fact right along down the years—the largest State society in the world, and the best; the best fellowship, the best of love one for another, and the most regular attendance upon the meetings of any society. It is the attendance upon the meetings that develops young men and makes them grow. I don't think I would have been worth two cents if it had not been for this society—certainly not to the world and not to dentistry.

I have attended nearly all the meetings. My first affiliation was with the St. Louis society, before this society was organized, but when this society began to show its work I came in with it and have been with it ever since. The first meeting that I missed afterward I believe I had to stay at home to meet that boy (pointing to Arthur D. Black).

Dr. Cook:

Mr. Chairman, he is bragging again.

Dr. Black:

Well he insisted on keeping me away from the meeting, and I did not like that at that time, not a bit. I don't know that this matter of bragging hurts us any if it is done modestly. (Laughter.)

Dr. C. M. Mead, Mt. Carmel, Ill.:

I am a young practitioner and this is the first meeting I have attended of the Illinois State Dental Society. I am sorry to say it is the first. There has been so much said concerning our President's address that is so very excellent and so beneficial that it is unnecessary for me to say any more in regard to that, but I do want to say in regard to Dr. A. D. Black that we dentists in Southern Illinois have a very warm place in our hearts for him because we feel that he has been instrumental in helping to bring something good out of what we might call chaos.

In regard to the bragging statements concerning this society, I think they are very unnecessary, because the fact of the matter is we know this is the best society in the world or the Methodist church wouldn't have opened its doors to us. (Laughter).

Dr. Duncan:

In closing the discussion said:

I have nothing to say except to thank you for the kind words you have said and for the kindly reception you gave my paper.

DISCUSSION OF REPORT OF COMMITTEE ON DENTAL SCIENCE AND LITERATURE.

Dr. C. R. Taylor:

It seems to me one can hardly discuss such a paper as that, and yet it is a very valuable thing from the fact that we can turn to our library at any time after we get the printed proceedings and find in this report where we can obtain this very important information that has been catalogued by Dr. Allen. I think the society, if it does not care to discuss it, should at least acknowledge the effort Dr. Allen has put forth to produce such a report.

On motion of Dr. Reid, duly seconded, the report was accepted.

DISCUSSION OF DR. MUNROE'S PAPER, "OUR YOUNGER PATIENTS."

Dr. F. H. McIntosh, Bloomington:

A dreary place would be this earth,
Were there no little people in it;
The song of life would lose its mirth,
Were there no children to begin it.

No little forms, like buds to grow,
And make the admiring heart surrender;
No little hands on breast and brow,
To keep the thrilling love chords tender;

The sterner souls would grow more stern,
Unfeeling nature more inhuman,
And man to stoic coldness turn,
And woman would be less than woman.

Life's song indeed would lose its charm,
Were there no babies to begin it,
A doleful place this world would be,
Were there no little people in it.

Thus writes the poet, and a responsive chord vibrates in my own being as I read the lines. The care of these "little people," between the ages of three and ten years, certainly furnishes a problem that must be solved by each one of us, and then not always right, even with all the help we may be able to obtain. The essayist has well said, this is a very "important period," and we should impress upon parent and child alike the important knowledge that the first molar does not belong to the baby set, nor does the baby set have bicuspids.

It would seem unnecessary to call attention to the great importance of conserving the first molar. Yet a lack of knowledge on the part of the parent and the don't-care attitude of the operator, whether he work for these young patients or not, has led many times to the destruction of these sentinels that guard the line between regular or irregular teeth.

At this time I am getting ready a little talk which I expect to give before one or two grades of pupils in our public schools, with their parents, and tell them a few things about their teeth and present each family with a little booklet entitled "The Care of the Teeth," and "A Few Facts Relating to Modern Dentistry," prepared by a committee from our McLean County Dental Society. I am pleased that the essayist thinks it would be a wise move on the part of our State society to prepare such information for use by its members. The contents of this book will be readily grasped by the average person, and a line of information given to the parents they will be grateful for and which they have desired a long time, but did not know in just what way to get it. I encourage parents to bring their children to the office, from four years and upward. I get acquainted with the little fellows, ask them if they have teeth, too, and how many, inviting the mother to take the chair with the little one on her lap, let them see the mouth mirror, ask them to look in it; then I take the pliers with a pellet of cotton and pass over the teeth, give him a little box or bottle, invite him to come again, and you have made a start that will win to yourself a well-behaved patient.

These models of a child less than five years old, which I hold in my hand, but do not dare to pass around to you for fear that they may be injured, having given the same to Dr. G. V. Black, could not have been secured in any other way than by the method which I have suggested. The young lad sat on his father's lap, and the drawer containing the boxes was in view, and promise made that he might help himself to any or all of them; by this manner consent was secured. Do not throw away a box or a bottle; trifling articles they are, but can be used as entering wedges to the child's confidence.

These younger patients should be addressed as though they knew something. I use the same language, and in as polite a manner, to a seven or ten year old, as to either parent of the child. Acquaint yourself with bright and witty sayings of children and get them off to the young people. The following amused my patients lately:

A little girl who had not been studying very long about the human body was told to write a composition, and here is what she wrote:

"The Human Body is composed of three parts, the Head, the chest and the Abominable Regions. The Head contains the eyes, nose, mouth and ears, brains if any. The Chest has the heart, lungs and part of the liver. The Abominable Regions are devoted entirely to the Vowels, of which there are five, a e i o u and sometimes y and z."

In filling the teeth of children I use any material I can best use in a rapid way. Oxyphosphate of copper is my pet. Gutta percha is almost as difficult to introduce as gold, unless you are able to dry the cavity thoroughly. It pays to treat abscess conditions in children's teeth. I am using with good results a combination of a 50 per cent solution of tricresol and 40 per cent solution of formaldehyde, equal parts. This medicament you can seal in at most any stage of putrescence. Let patience have her perfect work. Be interested in all these young people say and do, and you will be their friend and dentist.

Dr. C. S. Case:

That which Dr. Munroe has said in his paper in regard to the care and preservation of the deciduous teeth can not be too forcibly emphasized. The subject is such a broad one in its scope it is hardly possible in a single society paper and its discussion to present much more than a generalization of its principles. I trust it will be followed by other papers and by a more thorough teaching in all dental colleges based upon true principles of science and art. It is a subject which lies at the very foundation of a general practice in dentistry, and yet how many men ignore or fail to understand its simplest and most common-sense demands, while they close their eyes to the harmful results which arise on every hand that are wholly due to a thoughtless disregard or lack of appreciation of the value of preserving the deciduous teeth up to the time of the eruption of their successors.

This is particularly true of the deciduous molars, which nature has endowed with broad-spreading roots, seemingly with a view of preserving the stability and integrity of the bases of the arches against the mesial crowding tendencies of the erupting first molars, which are the teeth, as Dr. Angle has very wisely pointed out, that establish the bases of the permanent dentures. If the deciduous molars are prematurely lost through the natural ravages of decay or under the mistaken notion—too prevalent with the laity and unfortunately with some dentists—that it is inadvisable to preserve teeth which are so soon to be followed by permanent ones, the permanent molars will invariably take a position forward of that which they would otherwise occupy. And if this movement is sufficient to carry the points of the cusps slightly forward of the normal boundaries of their sulci, the occlusion will aid in forcing them to the full width of a bicuspid in mesial malocclusion; thus all of the teeth in front of the molars are either crowded forward or thrown into mal-alignment.

If it were possible to trace the history of the causes which have led to that frequent irregularity characterized by a mal-eruption of the canine teeth, a very large proportion would be found to arise from a premature loss of the deciduous molars, and unfortunately too many of these conditions could be directly or indirectly, laid at the door of dentists. This is also true of a large proportion of other irregularities which are characteried by a mesio-distal mal-occlusion of the buccal teeth. Dr. Munroe's appeal to dentists to preserve the deciduous molars through their allotted periods of function, even though they be in an almost hopeless condition, is therefore well timed.

I can hardly believe that many dentists of information in this age indulge in the needless extraction of the first permanent molars, and never except in decided protrusions, and even then only under the most advanced capabilities of judgment and future treatment. This should be true also in regard to the extraction of the bicuspids, especially in the correction of overcrowded and mal-aligned arches that have arisen from local causes and which would have been otherwise in normal occlusion and dento-facial harmony.

In this connection I am happy to say that nothing has, or will have done, more to arouse the dental profession to the importance of preserving the full complement of the teeth and the advantages of a normal occlusion than the teachings of Dr. Edwin H. Angle and his followers. That they carry their claims beyond the bounds of reason is very natural in the present infancy of its development, but after all, this is only in accord with the history of the advent of all new ideas and methods of any value, which finally adjust themselves, as this will do in time, to its true place among the established principles of science and applied art for the general advancement of the dental profession.

In regard to the question of regulating the deciduous teeth, there is no doubt that the practice within certain restricted limits will in time become a valuable addition to the repertoire of the orthodontist. That the deciduous teeth are rarely in arch mal-alignment is no doubt mainly due to the fact that the natural laws of primary dentition are not interfered with in the manner that obtains during secondary dentition. It is true, however, that the occlusion of the upper and lower arches are frequently not in normal disto-mesial relations, due principally to prenatal causes. In those cases where it is possible and advisable to shift the buccal teeth with the intermaxillary force so that the bases of the arches will force the first permanent molars to erupt in and retain a normal occlusion, it will no doubt be a means of establishing a normal occlusion of all of the teeth. But all who can see beyond the teaching that a normal occlusion of the teeth must of necessity establish the most pleasing facial outlines, and who appreciate the fact that inherited facial inharmonies and deformities quite as frequently arise from mal-relations of the jaws and contained teeth as from other bones which characterize unesthetic features of different physiognomies, and who aim to accomplish the most artistic as well as useful and permanent results, will wait until they are sure of their ground before they put into early practice a method of correction recommended for all conditions, established upon the basis of a normal occlusion.

In regard to the early correction of permanent teeth during the period of secondary dentition, it should be remembered that frequently nature in crowding the teeth into mal-alignments, so common with the lower incisors, is performing the same physiological function as before eruption in bringing full, adult sized teeth into small, ungrown jaws, and therefore, with some exceptions, they should not be disturbed by any treatment which contemplates an extensive lateral expansion of deciduous arches which are proportionately normal in size. Though if any of the deciduous teeth are prematurely lost through injudicious extraction or otherwise, the permanent teeth should not be allowed to encroach upon the spaces and thus prevent the proper eruption of their successors.

If this has occurred with the molars, the first permanent molars should be restored to their normal occlusal relation and retained until the eruption of the bicuspids.

There is, however, one condition in which this forward movement of the permanent molars is desirable, and which might even warrant the extraction of the deciduous molars to bring it about. I refer to those cases which are plainly diagnosed as upper retrusions, and with the lower arch in normal pose. By allowing the permanent molars to drift forward and establish a more mesial position for all of the adjoining buccal teeth the need of opening spaces for the introduction of artificial teeth to support the arch in the protruding movement of the front teeth will be diminished, and what is of equal importance is the possibility of establishing a normal occlusion without causing a labial inclination of the upper buccal teeth which would arise from an extensive mesial movement by later artificial force.

R. M. Pearce (Rock Island):

It has been stated by the essayist that "When the little ones are brought to us showing great carious cavities and exposed or aching pulps, we are inclined to think that the care of the child's teeth should begin with as early a period as the conception of the mother."

I think we should not only be inclined to this belief, but it should be a well-established conviction; and we are remiss in our duty to the little ones if we do not, in connection with physicians, strive to impress upon the minds of mothers the importance of proper food and exercise during the period of gestation.

We can not expect to effect immediate reform in the mode of life, consequently our principal duty lies close at hand, in giving relief to affected parts. What can be more philanthropic in its nature than the care and treatment of our younger patients? This can best be accomplished by not only being thoroughly in love with our profession, but with the little ones as well. I venture the assertion that a dentist who does not love children is not successful with them.

The secret of success with children lies primarily in the manner in which we first meet them. Children, like grown people, are very prone to be influenced by first impressions. Having once gained the confidence of a child, it will take a great deal to shake that confidence; but on the other hand, if a child is not at first pleased, it may take much time to establish pleasant relations.

I do not wish to convey the idea that a child is to be humored in every whim; firmness should be used, yet the child can be made to understand and will appreciate the fact that we are doing what we know to be for the best.

When a child accompanies a grown person to my office, whether for service or not, I make it a point to notice that child.

Did it ever occur to you that it pays to keep your empty boxes, foil books and many other things that are a nuisance about the office, just to make a small child glad and make for yourself another friend? How children appreciate anything in the way of a gift!

Many of you no doubt will scoff at the idea, but try it and see what results it will accomplish.

It was but a few weeks ago a mother brought with her a weak, nervous four-year-old child, for whose conduct she insisted on apologizing. I admit his actions were such as to cause some nervousness on my part. I had not the time, nor was it expected that any one about the office should play nurse girl, but I suggested to the young hopeful that if he would come with me into the laboratory we might find something to please him. He was given two or three empty boxes, and forthwith commenced to amuse himself. Do you think the time was wasted? Not so. The child has since had to apply to me for relief, and got up in the chair and took his treatment like a major.

Could I have accomplished this without the aid of boxes? I do not think so, at least without expending much more time and patience, and perhaps then with the loss of his confidence. He sent me word last week he was sorry he could not come with his mamma. But did I have any more boxes?

I have not been successful in persuading patients of so young and tender years as the essayist speaks of—namely, three years of age—to like the use of the tooth brush, and use it intelligently. It is my experience that a child has to arrive at the age when self pride begins to play an important part before he will conscientiously use the brush.

I should like to say one word in this connection, with reference to the relative merits of powder and mouth washes. Teeth can not be kept clean with the use of washes alone. By them the mouth may be cleansed and purified, but to keep the teeth clean a powder must be used to remove the deposits and discolorations. I do not refer to calculus exclusively.

I agree with the essayist that the palpable ignorance on the part of parents with reference to the number and conditions of teeth is almost criminal in its nature, and some plan should be devised whereby the parent and child might gain this much needed knowledge easily. Some concerted action on the part of this society as a whole would do more to stimulate a move in the right direction than could be accomplished by individual efforts. Prizes might be offered by the society for the best essays by children of certain ages, barring the children of dentists, on the number, care and condition of the teeth.

I believe there is nothing that will work so well as a filling material in temporary teeth, as the plate gutta percha, especially in approximal cavities; it works as a twofold blessing, closing the cavity and procuring space, different materials being indicated in different cases.

After all that has been said and written with reference to premature extraction of temporary teeth, it does not seem that the practice can be carried on to any great extent by intelligent men, and we certainly should not be influenced by the wish of the parent when our duty is so plain. We are requested to perform such operations many times, and explanations count for naught too frequently, as far as the wish of the parent is concerned. The demand by many parents is not what will be for permanent good, but what will give immediate relief.

What has been said of premature extraction of temporary teeth is doubly true of the first permanent molars. As for filling material for this tooth, not only is the condition of the tooth to be considered, but as well the physical and nervous condition of the patient.

Ignorance on the part of the parent in the great majority of cases, of the existence of this tooth, does not bring it to our attention until it is in a most deplorable condition, and we can not do with it as we would, but as we can.

In the correction of irregularities, as in any other branch of our practice, we should always be alert to the welfare of the patient, and be prepared by knowledge to render the best service, for while it is true the profession is tending to specialized lines, as in every walk of life, yet until more adequate means are provided for the accomplishment of certain purposes, we in the smaller communities must be jack and master of all departments.

Dr. C. R. Taylor (of Streator) :

This subject is of so much importance that there ought not to be a moment lost in the discussion of it, and we should feel the utmost freedom in giving expression to our experiences, and should not be afraid to say no to a question where others may say yes. I hope the young men of this society will feel the utmost freedom in expressing their views. It is to the young men we must look, as some of us are getting old, and we want the young men to be free to discuss the questions that come up, and make this one of the grandest meetings in the history of the society.

As to the paper, Dr. Ottolengui came all the way from New York to Chicago a short time ago to talk about filling children's teeth with gold, and the best thing he said was what has been stated here this afternoon, that "a man is not fit to work for children who does not love children." I will go further than that, and say that no man is fit to be a dentist who does not love humanity. A man who comes as close as you and I to patients should have the highest ideals and the greatest desire to do patients a personal service. In touching a child we are touching one of the holiest things that you and I know anything about. If there is anything better than a little girl it is a big one. (Laughter.) It is that idea of life that we want to feel constantly. When we inflict pain we should not do it thoughtlessly, but we should not hesitate to do it if it is necessary. When a patient scolds me for inflicting pain I tell him I would rather have him do that than to accuse me of doing imperfect work. I say to patients, I would rather have you tell me that I am "rough" in my manipulations than to say I am incapable. If we can get those things instilled into the minds of the little people we are working for, we will accomplish a great deal.

As to the treatment of children's teeth, I agree with those who have referred to the use of gutta percha. It is one of the best filling materials we have for certain cases. In children's teeth, where there is much decay, in occluso-proximal cavities, there is nothing that will equal it, for two reasons. In the first place, if you do not wish to have gutta percha jammed down on the gums and cause annoyance, put a little piece of wire across from one tooth to the other, either of German silver or gold wire. There will take place, every time the patient chews a piece of beef or any food a tendency to separate the teeth and expand the jaw. I have one patient who as a child had very defective teeth, but when the permanent teeth came in she had an abundance of room. I think I expanded the jaw anywhere from one-eighth to one-quarter of an inch on each side by these temporary fillings, keeping them in good condition by renewing them, for five years. In these cases I use nitrate of silver to prevent decay, and I treat a great many children's teeth with the same care and fill the roots with the same care that I do the permanent teeth. In some cases we can not do that. Then we have to temporize and do the best we can. Some of the most heroic patients I have ever had have been little children whose confidence I have gained. Don't extract children's teeth unless absolutely necessary, but try to prevent decay and keep the teeth until the permanent ones are to erupt.

I think sometimes the orthodontists get the idea that every child who comes with a tooth a little crooked should have some appliance put on to regulate it. There are hundreds of cases which, if you will just aid nature a little, do not need any elaborate appliance. Of necessity there will be irregularity, lapping of the teeth, for a time when the jaw is small. That is the force by which nature expands the jaw herself in some cases of irregularity, and in a year or two the teeth become regular. Sometimes the most simple appliance will serve a useful purpose, though it may not bring you many dollars. Just a cap made of German silver or gold put on a lower tooth may dispense with a costly appliance later.

I want to emphasize again that in my opinion gutta percha enlarges the jaw and prevents decay of the teeth when you could hardly fill them or cap them successfully with any other material.

A Member:

I would like to ask Dr. Taylor to explain his method of using nitrate of silver.

Dr. Taylor:

I have no particular method of using it. A convenient way is to have a bottle with crystals in it, moisten a pledget of cotton and touch it to some of the crystals. I don't want to get any particular percentage, as it is fresh then and acts promptly. I am not so particular in applying it. I paint children's teeth with it until they look as black as a stovepipe (I mean the front teeth) and polish them afterward. Sometimes, to prevent further decay of the teeth, I cover them with the solution, and if they come back, I polish them off afterward. I do not care so much about the back teeth being black. The principal thing is to prevent suffering on part of the child and save the teeth. We can not always depend upon the parents to look after their children to see if they do the proper thing or not. I have no particular way except what I have told you.

Dr. G. V. Black (of Chicago):

What do you do in exposing this precipitate of silver to light?

Dr. Taylor:

If you want precipitation immediately, an easy way is to put silver in the cavity also; that is, if you have a little piece of amalgam filling, put it in the cavity when you put in nitrate of silver; you get a precipitate there and staining at once.

Patients come who have suffered from typhoid fever, who have been sick for a number of weeks, and you will find that the surfaces of the posterior teeth will be more or less eroded. I use nitrate of silver in those cases with good results. I use it repeatedly; I polish the surfaces of the teeth every time they come, and reapply the nitrate of silver, especially on the back teeth.

The next best thing as a preventive of decay is the chloride of zinc. I think it is one of the best agents we have as a preventive of decay of the teeth. It is one of the greatest remedies we have in pyorrhea, especially where decay is associated with pyorrhea.

Dr. C. E. Bentley:

I do not think it is wise for so distinguished a member of this body as Dr. Taylor to advocate as he has done, without some contravention, the wholesale use of nitrate of silver in crystals in children's teeth, as he has indicated. I think a 50 per cent solution is strong enough.

Dr. Taylor:

Pardon me; I did not say I used the crystals. I said I moistened a small pledget of cotton and touched the crystals; I do not carry the crystals into the mouth.

Dr. Bentley:

I misunderstood you, then. The crystals of nitrate of silver in the mouth, when they come in contact with the saliva, will produce a severe scar wherever it flows upon the mucous membrane, and you may not control it readily. Gutta percha—pink flake gutta percha—when the cavity is dried and the gutta percha slightly moistened with cajeput, becomes a very effective filling for children, and it can be put in quickly, and the cajeput will practically etch the surface of the gutta percha and make it seal the cavity. A most important filling material, one, I think, which does the greatest amount of good for me with these little patients, is that splendid cement that was given us by Dr. Ames, called the oxyphosphate of copper. It is not a cement, because it becomes almost a permanent filling. It has a metallic characteristic. In my hands it is the most potent remedy for the saving of children's teeth of any thing I know about. It has one drawback, and that is when it is applied to sensitive dentine it irritates for a time and possibly causes some pain, but that is soon over with. Under the most unfavorable circumstances, such as if the cavity were almost flooded with saliva, we can put oxyphosphate of copper in a cavity with the reasonable assurance that it will hermetically seal that cavity.

Dr. G. V. Black (of Chicago):

I feel inclined to say just a word in regard to the use of silver nitrate. I have been interested in what has been said along the line of treatment of children's teeth, a thing we should do very much more of in future than we have done in the past.

I also wish to emphasize what has been said in regard to the use of oxyphosphate of copper cement. It seems to me it is a good thing to use in this place. In the use of gutta percha I think there are one or two other agents that dissolve gutta percha a little faster than cajeput; eucalyptol is one. By moistening the cavity with this we make the filling adhere to the cavity wall, and this is very important.

Silver nitrate should be employed with a great deal of care. We should not use it in very deep cavities where there is danger of irritation of the pulp. It is in beginning of decay of the teeth that it is especially useful. I like to put my patient in the best light possible, in the sun if I can. I crush a crystal of silver nitrate on the glass side we use for cement and put a drop of water on it; stir it for a moment, then touch the end of a toothpick to it and carry it to the cavity with that, having had the cavity dry. The rubber dam should be in place if practicable, at least so arranged that the cavity is dry. Let this application dry, if possible, in the sun, and within fifteen minutes the silver will be precipitated and it will become black; if not so at the first sitting, repeat it from time to time until you get a thoroughly black surface. None of the enamel that is sound will be stained by the silver nitrate, of if stained, it can be easily rubbed away, but the decayed portion that has been affected by the acid will be permanently stained. The silver nitrate will penetrate it and be precipitated within the decayed tissue, and should be permanently black, and so long as there is a dark color there will be no return of the decay. If there is a recurrence of the decay this treatment should be repeated. We ought not to stain the tissues of the mouth, nor of the face,, nor the clothing in the handling of silver nitrate. If we allow it to touch the skin there will be a black spot next day certainly. It removes sensitiveness promptly usually, though there may be a little pain immediately it is applied if the dentine is sensitive.

In the treatment of the incisors with silver nitrate I would cut them away somewhat after the Arthur method, particularly if a child is three and a half or four years old, for after that time the deciduous teeth will not drop together. Expansion of the arch is going on by growth, and the permanent teeth are coming down into the position requiring room, so that the deciduous teeth after that age will be held apart. Beginning cavities upon the proximal surfaces should simply be trimmed, the surfaces cut away with the V-shaped opening toward the lingual surface, and the nitrate of silver should be used without excavating the cavity. Do not cut out the decay, but saturate it with the silver nitrate and get the black color, and the little fellows will so use their teeth as to keep the cut surfaces pretty well cleaned, and we will have practically no more decay.

This manner of using silver nitrate in the teeth of these little patients is very important, and I do not feel that I can recommend it too strongly, and yet the whole process should be very carefully carried out, and certainly we should not risk spilling silver nitrate over the tissues or over the teeth, but apply it where we want it, and do it carefully. True, it will not injure the enamel, but it does injure the other tissues. It is a caustic and acts very promptly, and we should only use it on soft tissue which we want to destroy. There is something in this precipitation of silver that seems to hinder the re-beginning of decay, so that we can rely on it as we would rely on a good temporary filling; not as a permanent thing, but as a thing that will hold often until the deciduous teeth are shed. More frequently, however, it must be repeated.

Dr. Otto Holinger (of Chicago):

In the use of strong solution of nitrate of silver it is necessary to neutralize any of the solution which escapes from the confines of the area intended for its reception, for nitrate of silver solutions, except the very weak ones, are escharotic.

For that purpose I am in the habit of flushing out the mouth with a solution of common salt, say 50 per cent, but most any strength will do. In that way the insoluble silver chloride is formed.

Silver chloride when dry has a sandy consistency, so that it should be well washed out of a cavity.

But for erosions or exposed surfaces, where the silver nitrate must be limited, I am in the habit of using the stick, or "lunar caustic."

Another combination of silver nitrate is that with iodine, forming the insoluble, soothing iodide of silver.

This is done by first applying tincture of iodine liberally over the gums and about the teeth, but not in the cavities, for the teeth will become discolored; then apply about a 10 per cent silver nitrate solution immediately on a small swab and follow this with some more iodine, which prevents any free silver nitrate remaining, and although there is a surplus of tincture of iodine, yet that is quickly washed out and is only irritating. This application I use very frequently, especially after cleansing the teeth and all infectious conditions of the gums and oral cavity.

Dr. L. S. Lourie (of Chicago):

I hesitate to thrust my views upon the assemblage here because specialists are apt to be considered a little radical. However, I want to commend Dr. Taylor's idea of using gutta percha for filling the temporary teeth of children, and especially the idea of wedging them and enlarging the jaw in that way. This is contrary to the usual custom of using cement for filling the deciduous teeth. In the use of cement it washes out after a short time and you have a constantly contracting arch, or amalgam fillings are made without wedging to allow full mesio-distal restoration, and when the permanent teeth are ready to erupt they have not nearly the room it was intended they should have if the temporary teeth had been preserved. In so many cases there is a diminution in the size of the arch. This is more important than many general practitioners believe. There are many cases, in my own practice as well as in the practice of other specialists in orthodontia, in which the irregularity is caused primarily by the contraction of the arch early in life. To my notion prevention is better than cure, and it is within the province of the general practitioner to prevent a great many cases of irregularity.

The dentist is responsible in many cases for decay of the first permanent molars, because so little care is taken of the deciduous teeth that the parents get an idea that they are of little importance, and they are not able to differentiate between the first permanent molar and the deciduous molar.

Another point has been suggested—that the wedging of the permanent teeth into the space occupied by the smaller deciduous teeth is a natural process of growth. If there has been some disturbance in nutrition during the development of the maxilla, there is usually contraction of the dental arch, and if the permanent tooth does not have as much space as was originally occupied by the deciduous tooth, it is not reasonable to expect that the permanent tooth will wedge itself into place. It is nature's plan that the permanent tooth should do a certain amount of work in expanding the jaw. If the space occupied by the deciduous tooth is left, the permanent tooth will usually wedge its way into proper position, unless it has started in a wrong direction. The permanent tooth, coming down in its normal line of eruption, will have much force and will probably wedge itself into position, but if it has started labially or lingually and has not as much room as was occupied by the deciduous tooth, it is not reasonable to suppose that it will wedge itself into place. The force may be in the wrong direction. The tooth in labial occlusion exerts itself lingually instead of proximally. A very simple appliance can be applied to the teeth of children to bring about the movement of them easily and in a short time; whereas, if it is left until the tooth has expended its erupting force, there will not only be one or two teeth to regulate, but many more. The general practitioner should study closely the positions of the teeth of children.

Dr. G. V. Black (of Chicago):

I would like the privilege of correcting an impression which I seem to have made in my previous remarks, because I did not carry the subject far enough. Understand me distinctly, I should not treat the deciduous molars as I would treat the incisors. If I did, I would create the trouble that has been spoken of by the last speaker. With the deciduous molars we should retain all of their mesio-distal breadth. We should never give up any of it. The positions of the deciduous molars control the position of the eruption of the first permanent molars, and upon the position of those teeth depends principally the irregularities. The deciduous molars have a greater mesio-distal breadth than the bicuspids which replace them. But the permanent cuspid is larger. If we lose the space of those little molars, the first permanent molar will erupt too far toward the front, and when the bicuspids come in they will take all the remaining space, and the cuspid has no room. It comes a little bit to the labial and forces the lateral incisor into lingual occlusion, and the whole arch is thrown into a jumble simply because we have not retained the space occupied by the deciduous molars.

Dr. George E. Warren (of Pontiac):

I would like to ask the essayist, or any one present, for advice in the case of my daughter, five years of age. She has the most irregular teeth I have ever seen in a child. The lower incisors are badly jumbled up and the upper left lateral is locked inside of the lower teeth. There are no cavities in the posterior teeth to be filled with gutta percha. I would like to know what to do in such a case.

Dr. Bentley (of Chicago):

Send her to Dr. Lourie.

Dr. C. R. Taylor (of Streator):

I think possibly I may have been misunderstood in what I previously said. When a man with the clearness of speech and intellect of Dr. Black is misunderstood, I fear that I may have been. I supposed I was talking to practitioners of dentistry, and not to students, when I spoke of the use of nitrate of silver. I thought you knew it was a dangerous drug and that in using it you would take every precaution. If I told you to use the actual cautery it would be unnecessary for me to say to you it was a hot iron you were using, that you must be very careful not to burn the patient's face or clothes, so you should not let this drug come in contact with those parts which you are not expected to treat. (Laughter.) It is in the extreme cases where we can not get the cement fillings to stay in that I advocate the use of gutta percha. Gutta percha is useful in those desperate cases where the pulps are destroyed and in cases where there has been a contraction of the arch by the posterior teeth coming together from pressure of the first permanent molar, and where you have to build a rail fence, so to speak, to guard against the gutta percha being pushed down and injuring the soft tissues. If you have not used it, I would advise you to go home and do so, and if you do not get satisfactory results you can jump on me next year. (Laughter.)

Dr. Pritchett:

What becomes of the wire in these cases?

Dr. Taylor:

If it is a live wire, it is there all the time. As long as you have roots of teeth it lies in the pulp chamber, stretching from tooth to tooth. If you have dead pulps, you will have an abundance of room for a wire, which will be held in place by the gutta percha, and it will restrain the gutta percha from crowding into the gum tissue. At the same time it does not prevent the gutta percha from crowding the molar teeth apart, and thus helps to expand the growing jaw as the bicuspids grow into position.

Dr. R. N. Lawrence (of Lincoln):

There is a suggestion contained in Dr. Munroe's paper which should be carried out by this society. I refer to the suggestion in regard to the State society publishing some pamphlets to enlighten the public as to their need of our services.

In order to get the matter before the society, if I am in order, I would like to make a motion that the president appoint a committee of three to prepare this pamphlet to be distributed among the dentists of the State as they see fit. But no dentist's name should be attached to it. I believe it will prove of benefit to the public.

The motion was seconded, and the matter was referred to the executive council.

Dr. C. M. Mead (of Carmi, Ill.):

It has been my practice for about ten years to use amalgam almost exclusively in the posterior deciduous teeth. I have listened to the remarks of the older men with a great deal of interest, and I am wondering if I have been practicing incorrectly. Some use oxyphosphate, others gutta percha. I have tried both of them, and my experience has been to keep cavities dry without use of rubber dam is very difficult. My first difficulty is in getting adhesion to cavity walls, due to not being able to exclude moisture; and secondly, where I can get perfect adhesion, the attrition from mastication will allow the approximal surfaces to come together and cause contraction of the arch, and for that reason I have not been able to get cement fillings or gutta percha fillings that will last, and hence I have used almost exclusively amalgam in these cases. I use it in any state I think best, and I contour the deciduous teeth as carefully, if not more so, than I would the permanent teeth with amalgam fillings, and I wonder if I am wrong about it.

Dr. Munroe (closing the discussion):

I am more than pleased that my paper should have elicited so much discussion. I think among the chief things an essayist can take pride in is to get the members sufficiently interested to discuss his paper, and having done that much I feel that my paper has helped you some.

I am a staunch advocate of gutta percha, as you understood, I judge, from the way I read it in my paper. I do not often use a medicine in connection with the gutta percha, but I make every effort to keep the cavity thoroughly dry. Sometimes, however, when there is difficulty in doing that, I use a tiny bit of chloro percha before I start my gutta percha into position. When there is quite a large interproximal space, in order to prevent jamming of the gutta percha up against the sensitive gum, I have found considerable satisfaction in using a little roll of bibulous paper, rolling it quite tight, placing it in position, so that it can be easily pulled out after the gutta percha is in place. When I push the gutta percha up there is something to prevent jamming it against the sensitive gum. After I have finished my fillings they rest across the two teeth, and I clip the bibulous paper on one side and pull it from the other, or by moistening it with water I can pull it from both sides, so that it will come away more readily.

Dr. Pritchett asked what became of the wire. I think that was a very appropriate question, because if the adjoining teeth had separated, certainly the wire would not rest against the teeth where it had been placed, and it might go up against the gum and cause some irritation. For that reason I like the bibulous paper very much better. The worst objection that I find to the use of oxy-phosphate of copper which has been very satisfactory in many ways, is that if you happen to put it into a cavity where there is a little larger surface approximation, and the pulp becomes very much disturbed, you will have a little trouble in getting it out of that tooth. A gutta percha stopping you can get out of the cavity with heat, and afford relief. I have had experience with both fillings. I have also had experience with amalgam. If amalgam has been in the cavity of a child's tooth for a while, you will notice the teeth separating, as they will do in children's mouths, and you will find that the amalgam filling will drop from its position.

After having written my paper I had the pleasure of reading an excellent paper by Dr. Peck on "Ethics." I want to read one sentence I noticed in it that struck me forcibly, and with that I close: "We must thoroughly qualify ourselves for the practice of our profession, in order that we do not violate one of the fundamental principles of ethics."

NORTH DAKOTA DENTAL ASSOCIATION, FARGO, N. D., JANUARY 16, 1906.

DISCUSSION OF DR. ROBERTSON'S PAPER, "REFLEX NEUROSES."

Dr. Weeks (of Minneapolis):

I scarcely feel competent to discuss this paper, since my experience has been very much more limited than that of the essayist. I am reminded of a remark a medical friend of mine made last week, that such conversation was graft. I made the remark that a man possessed of moderate ability and a large amount of gall would succeed better in the city than in the country. I believe there is more necessity for a man being an all-round practitioner in a small community, because he is there put upon his mettle. In the city it is easier to refer to Dr. So-and-So as a specialist. In a small place a man has to know about all.

I suggest that we inform ourselves on this subject, as on all others, that we may be prepared for such obscure cases. The paper is worthy of being printed and of being in the hands of every member.

We know it is authentic and reliable. I suggest that we all inform ourselves on this subject. I address in particular the younger members. I am a specialist myself, and don't feel competent to discuss this paper. My remarks are in the form of a suggestion.

Dr. Walls (of St. Paul):

I regret having missed the first part of the paper. Some points Dr. Robinson was bringing out were of considerable interest to me, though I feel hardly competent to discuss the matter presented.

Speaking of children's teeth, it is granted by 50 per cent of the medical men that many diseases of children who are afflicted with stomach, followed by bowel trouble, are not caused by eruption of teeth. It was not until I had children of my own that I took interest enough in the subject to satisfy myself regarding the cause of these infantile troubles. I came to the conclusion that the eruption of the teeth played an important part in the life of the child. The thought came to me that with the eruption of the teeth troubles that had been running on a week or two immediately passed away.

The claim is made that the cicatrix tissue is harder to be broken down than most tissue. It is a great mistake to lance for erupting teeth, as it prevents eruption later on. The doctor referred to the case of a woman from whom he had extracted four or five teeth at once; the hemorrhage lasted so long that he was called to stop it. He was delayed in reaching her, so that the hemorrhage had stopped in the meantime.

Dr. Rawlings (of Bismarck):

I want to relate one incident. A lady had treated for earache for a long while, and on the removal of the pulp from an incisor the trouble entirely disappeared.

Dr. Weeks:

My wife suffered from severe pain for some time. She visited a physician, who did not succeed in helping her. She was finally referred by him to me. I found the aistal surface on the upper left second molar affected. I filled the cavity with oxy-phosphate. That was five years ago, and the filling is still there.

Dr. Robertson (closing the discussion):

A friend of my wife had earache so badly that she was prevented from going out of doors. Her physician gave her morphine, but with no permanent relief. I examined her teeth and extracted a lower third molar, after which she had no further trouble.

THE DENTAL REVIEW.

Devoted to the Advancement of Dental Science.

PUBLISHED MONTHLY.

EDITOR: C. N. JOHNSON, M. A., L. D. S., D. D. S.

Subscription price $1.00 a year including postage, to all parts of the United States and its possessions, Cuba, Canada and Mexico. All other countries $1.75 a year.

EDITORIAL.

THE VALUE OF LOCAL DENTAL SOCIETIES.

No one can doubt the benefit to dentistry of our State and National dental organizations. Whatever their shortcomings, they have been instrumental in giving a status to the profession and commanding the attention of the public in a way that no other effort could have approached. Their scope is wide and they deal, or should deal, with the larger events and interests of the profession.

But so far as specific and practical benefit to the individual is concerned, the local society must be given credit for accomplishing more good than any other one factor. There is no individual isolation in the local society. Men come together face to face, elbow to elbow, and heart to heart. They criticise freely and commend freely. There is a rapid-fire exchange of ideas which stimulates thought upon the very things that are done every day in the office. And this is what helps men to do better work for their patients. A paper upon the larger issues of the profession read before a national meeting may broaden a man's ideas and make him a better thinker. It is necessary to the advancement of the profession that we have such papers, and yet the little practical things that are freely given and taken at local meetings are just as important in our daily work, and really bring a more immediate return in the betterment of practice than most of the material presented before the larger societies.

During the past winter there seems to have been a special interest manifested in our local societies. The Chicago-Odontographic Society, for instance, has had an unprecedented monthly attendance. It has never been under 200 and has on one or two occasions been between 300 and 400. The monthly clinics have been well attended and the interest maintained throughout the season.

The local society is bringing out many of our younger men, and affiliating them with society work. This is the great hope of the profession, and should be fostered in every way. In every town or district with four or five dentists a local society should be organized and faithfully maintained. It is the surest way of developing men into correct methods of practice, and into wider and more extended usefulness.

THE EDITOR'S DESK.

DRIVING UP THE COWS.

I remember when a lad,
How it made my spirit sad,
To be routed out of bed at break of day;
And how I made my vows
That the pesky milking cows
Should be slaughtered if my will could have its way.

How I trotted through the dew
When the day was crisp and new,
How I tramped again when it was nearing night;
How I stubbed my sore toe,
Adding pain to grief and woe,
How a stone-bruise fostered my unlucky plight.

In the pasture by the brook,
In the very farthest nook,
Where a bald and knobby hill had reared its head;
The lazy cows would hide,
Just upon the other side,
And lie as still as if they all were dead.

How I used to strain my ear
Agonizingly to hear

The tinkle of the cowbell on old Bess;
But that cunning, foxy thing
Never made the clapper ring,
When 'twas milking time as near as she could guess.

And in dog-days, when the flies
Swarmed about with eagle eyes,
Pouncing on the spots beyond the reach of tail,
How the maddened cows would rush,
Frantic through the underbrush,
And in milking how they used to kick the pail.

Then upon a rainy day,
When the atmosphere was gray,
And the air was filled with slanting sleet and hail.
The dripping cows would mope
Slowly up the pasture slope,
Where the path wound round the hillside like a trail.

Those were days of long ago,
When the world was very slow,
When the large events of life were passing rare;
And my boyish hopes and fears
Fled like April's fleeting tears,
With the driving of the cows my greatest care.

But the days have changed about,
Other cares have found me out,
And I look with longing eyes toward the past;
Not regretting what has sped,
Going willingly where led,
Full resigned to take my lot as it is cast.

Thus the trials of a boy
Have become my greatest joy,
And I fondly reconstruct my early vows;
Now my richest, rarest treat
Is to trod the meadow peat,
As in days of long ago to drive the cows.

DOMESTIC CORRESPONDENCE.

NEW YORK LETTER.

The Central Dental Association of New Jersey held its last meeting for the season on May 21st at the Continental Hotel, in Newark, N. J. After the usual banquet, the president, Dr. Vinson, called the meeting to order and asked attention to a few remarks from that old war horse of New Jersey dentistry, Dr. Charles S. Stockton. It was the first dental meeting Dr. Stockton had been able to attend since February of the previous year—1905. He had met with an accident hurrying to his train—fallen and broken two or three ribs. Following that he was under the surgeon's knife, and later seriously ill, so that his life was despaired of, and for nearly, if not quite, a year incapacitated for business. On this first opportunity of meeting his old friends face to face, he wanted to talk to and thank them for their many kind remembrances of him during his long illness.

Dr. B. F. Luckey spoke of a visit he had paid to the veteran, Norman W. Kingsley, who is spending his declining years on a little farm he owns near Paterson, N. J. He brought words of good cheer and greeting from the doctor to the members of the C. D. A., of which he is an honorary member.

The president then introduced Dr. John Egbert Nyman, of Chicago, Ill., who read a paper entitled, "The Management of Extensive Cavities in Bicuspids and Molars." This was a brief but comprehensive description of his method of making gold inlays, and an advocacy of their use, to the exclusion of any other form of filling in the class of cavities mentioned. The discussion was opened by Dr. R. Ottolengui, who seemed to agree more with the essayist than did some others who said they would use porcelain rather than gold in bicuspids on account of the esthetic appearance, claiming that properly made they would stand the stress of mastication.

Following somewhat in the footsteps of the Institute of Stomatology, the Institute of Dental Technique at its meeting on May 22 had a paper on "Fixed Regulating Appliances," by Dr. J. Lowe Young, formerly of Detroit, but now an acclimated New Yorker. Both these societies have given much time this year to orthodontia, and several good papers have been read.

The new dental magazine, to take up the work of the "International," has made its appearance as a quarterly, and as the "Journal" only, that name being used apparently because it gives only the reports of the New York Institute of Stomatology and the allied societies in Boston and New England. It makes a very neat appearance and will undoubtedly be acceptable to a large number of practitioners. It is embellished with a very fine portrait of the late Dr. Charles F. Allan, of Newburg, N. Y.

The New York Institue of Stomatology held its last meeting on the 31st day of May.

Dr. Henry W. Gillette made a few remarks on "An Aid in Pyorrhea Treatment, and Other Suggestions." He spoke of the use of acetozone and vaseline, equal parts, for allaying the pain from calcic abscess. He showed a very neat glass syringe, with removable parts, so it can readily be cleansed, which he has had made in Boston. By its use he can get the acetozone and glycerine into the pockets readily. Attention was called to the use of formalin for sensitive cavities in buccal surfaces.

The essayist of the evening, Dr. E. A. Bogue, was then introduced. He presented a brief but highly interesting paper, with lantern illustrations, entitled "Theories Made Facts in the Corrections of Abnormalities in Children's Teeth," describing three cases now in his care where correction was begun on the deciduous teeth with remarkably good results.

The discussion was altogether laudatory, being participated in by several prominent physicians and surgeons of New York in addition to various members of the Society. The next thing in order now will be to go to New Jersey for their annual meeting at Asbury Park the third Wednesday in July, when we are to have lots of good things, so they tell us. Yours truly, "THE BOROUGHS."

PRACTICAL HINTS DEPARTMENT.

EDITED BY G. W. JOHNSON, D. D. S.

[This department is for busy readers. We want short articles containing practical ideas—the shorter the better. No article must exceed 200 words, unless of exceptional merit. Every dentist has some useful hint that has been of value to him, and if he will only put it in print it may be of equal value to others. That is what this department is for. Due credit will be given for every article sent. Address G. W. Johnson, THE DENTAL REVIEW, 55 State street, Chicago, Ill.]

To keep Hypodermic Needles from Rusting:—Simply dry the needle out with blasts of hot air from the chip blower. Throw away the little wires and you will be surprised how long your needle will last.—*C. E. Conley, La Sueur, Minn.*

To Soften Calculus:—Before removing salivary or serumal calculus it will be found advantageous to apply tincture of iodine. A few treatments of this will tend to disintegrate the deposit and thus facilitate its removal.—*E. M. S. Fernandez, Chicago.*

Protecting Porcelain Surfaces for Solder Work:—If porcelain surfaces in bridgework are coated with sandarac varnish before investing, and care is taken to have the investment thoroughly heated before beginning soldering, it will result in little or no cracking or checking of the porcelain.—*Henry C. Lee, Chicago, Ill.*

To Polish Plates:—Use powdered pumice stone moistened with "Johnson's Ethereal Soap" (Parke, Davis & Co.), employing either felt cones or brush wheel. It is cleaner than when water is used to moisten the pumice and will save time.—*E. T. Evans, Decatur, Ill.*

Make Your Artificial Dentures Yourselves:—It is difficult to see how satisfactory results are obtained by those practitioners who, in the parlance of Christian Science, apply "absent treatment," by taking the impression and bite, themselves, and then have a laboratory man who has never met the patient do the remainder of the work—*Charles R. Turner, Philadelphia, Pa.*

Use the Rubber Dam:—I am a thorough believer in the rubber dam and use it on almost all occasions. You can not see as well what you are doing without it; you can not exclude the saliva and the contained organisms, and the debris of decay and cut-tooth substance, as well as medicaments and filling material fall into the mouth to the annoyance and disgust of the patient. In the treatment of teeth it should always be used.—*J. V. Conzett, Dubuque, Iowa.*

Oxy-phosphate of Copper:—An excellent material for filling sulci in first molars is found in oxy-phosphate of copper. It is easily inserted by simply drying the cavities out and filling them without the use of an instrument of any kind unless it be a small probe to remove particles of food and alcohol and chloroform to dry out and dissolve any fatty substances in the sulci. The oxy-phosphate of copper can then be flowed into the sulci of the defective tooth, and it will last for years.—*C. R. Taylor, Streator, Ill.*

Fees for Advice:—Members of the dental profession need to understand better that patients applying to them for advice receive the benefit of professional knowledge and are benefited thereby. The dentist, however, too frequently while doing his duty to his patient, fails to do his duty to himself. I believe the long period of free services in his consultation room should end and that people who are able to pay for that which they receive should pay the dentist for his advice quite as freely as they would pay the physician for his. —*Truman W. Brophy, Chicago.*

Filling Posterior Teeth:—I can not help thinking that those enthusiasts who say that porcelain should be used in all forms of cavities will regret such statement in the near future. We must remember that the occlusal surfaces of bicuspids and molars present a series of inclined planes, and we get weak margins to our filling material. We have all had experience in building up such cavities with amalgam, and if we did so the patients always returned with the filling broken away. Porcelain, being weaker than amalgam, can not be expected to stand unless we can have bulk.—*J. Q. Byram, Indianapolis, Ind.*

Filling Large Cavities in Anterior Teeth:—I have found that in such cavities the insertion can be made almost entirely from the lingual, and I think we should insert as many of this class of fillings as possible in this way. I do not wish to be understood as advocating this as a universal practice, but cutting away from the lingual surface is less objectionable than cutting away from the labial. I have also observed that the advocates of retention of tooth substance in these cavities fail to cut beyond the point of danger on the lingual surface. This is faulty technique and a violation of the laws of extension for prevention.—*T. E. Weeks, Minneapolis, Minn.*

Treating an Alveolar Abscess:—I believe it is a mistake to carry a tooth along through weeks and weeks of treatment through the pulp chamber, and many of us make a mistake in treating teeth too often. Whenever an abscess forms about a root it nearly always surrounds the apex of the root. It destroys the peridental membrane around the sides of the root, consequently treatment through the root canal does not get at what we want, and after pus has been present for some time, if the surface of the root has been bathed in pus for many weeks, we will get satisfactory results from treatment through the pulp chamber in very few cases. I do not practice immediate root filling in such cases, but I have done it "more immediately" than is the general custom. In such cases I prefer to fill the root canal, and, if necessary, make an opening through the alveolar process.—*Arthur D. Black, Chicago.*

Method of Making Almalgam Dies:—Amalgam dies have become very popular for constructing gold and porcelain inlays, copes for crowns and for building up teeth that have decayed far below the gum margins, with gold.

Take an impression with pink base plate gutta percha in the following manner: Moisten the tooth and cavity with glycerine. Soften the gutta percha over an alcohol flame, being careful not to blister it, and force the gutta percha into the cavity with a broad instrument The glycerine will prevent the gutta percha from sticking in the cavity Flow a stream of cold water over the gutta percha to harden it; carefully remove and if the margins are perfect mix a small quantity of plaster, build it to a pyramid on a glass slab and invest the impression by forcing it down in the plaster with an instrument, being careful to have the plaster well up around the margins. When the plaster is hard mix the amalgam. I prefer to use alloy in the form of shavings or copper amalgam is better still as it can be used over again several times by warming it until the mercury appears in the surface and then grind it thoroughly in a mortar. Carefully pack the amalgam around the impression until it is well covered and then roll up a piece of unvulcanized rubber, about the size of a thimble, and wrap several thicknesses of rubber tape around this. Place it over the amalgam insert in a vise and squeeze out the mercury. Leave it under pressure three or four hours or over night. Then break away plaster, remove gutta percha and you will find a clean cut and polished die which is easily mounted in the swage and makes a perfect matrix.—*C. J. Hadley, Chicago.*

Matrix for Packing Porelain:—As we all know, the more dense we can pack the body the less shrinkage. In building up a large molar crown to be finished with one baking I have been pleased with the following experiment Having the pins gripped firmly in the proper holder, I cut a strip of sheet steel—of the thinnest sort, such as we use for matrices—and pinched this together around the cap with a small screw vise. Then I oiled the inner surface of the matrix to prevent the porcelain from adhering. I was then able to pack the body of the crown very quickly and firmly, absorbing the moisture that was pressed to the surface from time to time with blotting paper. I built high enough to allow for prominent cusps, then released the vise hold upon the matrix The spring steel let go, leaving a fine general contour and smooth surface. Then after having cut away enough of the plaster teeth adjoining to allow about one-sixth for shrinkage, the tooth to be was placed in the articulator and cusps carved to shape. Any required special forms of contour were added with a brush. I am sure that I got less shrinkage and a considerable saving of time by this method.

I may add here that it seems to me that I get a good final surface with soft spunk, dry or slightly moist, upon the nearly dry surface of the body.—*Garrett Newkirk, Pasadena, Cal*

MEMORANDA.

SCHOOL OF ANESTHESIA AND EXTRACTION OF TEETH.

This school has been organized in Chicago under the direction of Drs. L. W. Nevius, L. O. Green and F. K. Ream.

DEATH OF DR. ROBERT E. HANDLEY.

Dr. Handley, of Fremont, Neb., a graduate, 1905, of the Chicago College of Dental Surgery, died after an operation for appendicitis, May 9, 1906.

DR. E. K. WEDELSTAEDT HONORED.

At the commencement exercises of the Chicago College of Dental Surgery May 29, 1906, the honorary degree of A. M. was conferred on Dr. E. K. Wedelstaedt, of St. Paul, by President H. B. Brown, of Valparaiso University.

MONTANA STATE BOARD OF DENTAL EXAMINERS.

The next annual examination of the Montana State Board of Dental Examiners will be held in the city of Helena on July 16, 17 and 18, 1906. For further particulars communicate with Dr. B. J. Keenan, secretary of state board, Butte, Mont.

ST. LOUIS SOCIETY OF DENTAL SCIENCE.

This society has elected the following officers for the ensuing year: Adam Flickinger, president; Emma Eames Chase, vice-president; George H. Westhoff, secretary-treasurer; Richard Summa, curator; E. P. Dameron, D. O. M. LeCron and F. S. McKay, board of censors.

INTERSTATE DENTAL FRATERNITY.

The annual meeting of the Interstate Dental Fraternity will be held at the New Kimball House, Atlanta, Ga., on Monday, September 17, 1906.

The meeting and banquet will be in charge of Dr. Thomas P. Hinman, the vice-president for Georgia.

Dr. Hinman's well established reputation as a host is a sufficient guarantee for a royal good time for all of the frat. who can arrange to go. Do not miss it.

R. M. SANGER, *National Secretary.*

SWISS ODONTOLOGICAL SOCIETY.

The twenty-first meeting of this society will be held at Geneva in connection with the general meeting of the Federation Dentaire Internationale and immediately following it. A number of prominent dentists, members of the federation and others, have promised their active co-operation. Papers will be read or clinics given by Prof. W. D. Miller, of Berlin, Drs. Goden, Platschick, and Sauvez, of Paris, Mr. William Guy, of Edinburgh, Professors Pont of Lyons, Berten of Munich, Guiria of Genoa, Dr. Guerini of Naples, and a host of others. The official langauges will be French, English and German. A special committee of ladies will take charge of the wives and daughters of members of the congress during the session.

A most cordial invitation is extended to all members of the profession and it is hoped that a large number of our American confreres will seize this opportunity to visit beautiful Switzerland and include a trip to Geneva in the program of their summer vacation.

For information please address the undersigned,

PAUL GUYE, D. D. S., *President,*
12 Rue de Candelle, Geneva.

FEDERATION DENTAIRE INTERNATIONALE.

Provisional program of the session to be held in Geneva, August 8 and 9, 1906:

Opening General Meeting—

1. President's address.
2. Report of the secretary general.
3. Report of the treasurer and appointment of auditors.
4. Election of members of the international commission on dental terminology. (Chairman, Dr. J. Grevers.)
5. Election of members of the international commission on dental jurisprudence and professional ethics. (Chairman, Dr. William Carr.)
6. Discussion as to what shall be the plan of work of the F. D. I. in the immediate future.
7. Motion by a member to hold only biennial or triennial meetings.

Meetings of Commissions—

I. Commission of Education.—(a) Motion by Dr. von Arkövy: "Dentistry (stomatology) is a branch of general medicine and belongs to the edifice of medical science and medical education." (b) Motion by the French National Committee: 1. Complementary study of curriculum; 2. Study of the best means to be employed to establish regular relations between reputable dental colleges of different countries. (c) Motion by Dr. Chiavaro: "Physicians who wish to take a course in a dental college shall pledge themselves to continue their studies long enough to enable them to acquire sufficient experience in the practical branches of dentistry."

II. Commission of Hygiene and Public Dental Service.—(a) Motion by the French National Committee: Establishment of a definite plan of work for the commission. (b) Discussion on the advisability of publishing a booklet on dental hygiene. Report by Prof. Dr. Jessen, of Strassburg, Alsace: The dental infirmary for school children and its relation to the local dentists. (c) Questions proposed by Dr. Bryan: 1. How shall we reach, interest and educate the public in dental hygiene? 2. How shall the school children be treated to assure a useful dentition through life? 3. How shall the needy public be treated?

III. Commission on Military and Naval Dental Service.

IV. International Commission on the Dental Press.—Study of the means to be employed to bring about the creation of an international dental organ and to establish closer relations between the professional journals of different countries.

V. Commission on Jurisprudence and Professional Ethics.

VI. Commission on the History of Dentistry.

VII. Commission on Dental Terminology.

VIII. Commission on the Definition of What Shall Constitute a National Committee of the F. D. I.

IX. Commission on a Motion by Dr. Haderup of Furnishing the Poorer Classes with Inexpensive Tooth Brushes.

Closing Session—

1. Report of auditors and vote on treasurer's report.
2. Reports of the various commissions, I to IX.

3. Organization of the next international dental congress.
4. Designation of place for next meeting.

Members of the various commissions are requested to prepare reports.

W. D. MILLER, *President.*

EDW. C. KIRK, *Secretary-General.*

COLLEGE COMMENCEMENTS.

THE INDIANA DENTAL COLLEGE.

Graduates of 1906.—W. C. Ballou, W. Barnfield, W. L. Clark, C. O. Clemmer, H. D. Cofield, C. Ferguson, A. T. Funkhouser, J. Goldman, F. L. Gravis, C. Green, H. A. Kelsey, H. B. Ketcham, J. D. Kirkpatrick, H. Lamb, J. Lavengood, J. H. McClain, H. W. Marxmiller, A. Miller, H. Raper, A. Ross, C. Taggart, C. W. Witter.

THE STATE DENTAL COLLEGE, DALLAS, TEXAS.

The first annual commencement exercises of the State Dental College were held at Carnegie hall, Dallas, Texas, Friday, May 4, at 8 p. m.

The doctorate address was delivered by Hon. E. B. Muse, whose father was a graduate of the Baltimore Dental College and was one of the first graduate dentists in Texas.

The degrees were conferred upon the five graduates by D. E. Morrow, D. D. S., dean.

NORTH PACIFIC DENTAL COLLEGE.

Class Roll—A. M. Davis, S. J. Davis, F. R. Davis, J. R. G. Deyell, F. LeN. Fleehart, H. C. Fixott, J. R. Gilchrist, A. E. Gibson, H. Gove, C. W. Hanson, W. A. G. Handford, C. M. Harrison, H. Jackson, E. V. Jefferson, E. A. Keepings, G. H. Martins, C. P. Mason, E. H. Miller, N. Morrison, C. Mount, C. A. Proudfoot, J. C. Price, A. D. Perkins, E. M. Senn, J. D. Sheehan, S. S. Skiff, A. Stratton, J. C. Swan, B. F. Rambo, J. C. Tamiesie, C. M. Williams, C. Winters Jr., W. Ricen.

WESTERN DENTAL COLLEGE.

Class Roster—W. J. Armsrong, M. V. Baker, R. G. Boutin, A. H. Braden, E. H. Browning, J. R. Clark, C. E. Douglass, H. A. Duensing, G. E. Eubank, M. H. Fewell, C. Fahring, L. H. Goodrich, E. Hamel, S. M. Haught, T. J. Ice, C. M. Jackson, L. C. Krause, W. V. Lane, E. T. Lay, P. McDonald, A. E. Martin, A. Matthews, W. Mather, H. H. Ott, J. W. Ott, N. H. Peebles, J. D. Ratliff, F. G. Ratcliffe, R. K. Richter, E. E. Rosser, V. B. Shaw, V. A. Shoop, M. Sweet, R. B. Slayton, J. A. Taylor, C. Taylor, E. Trunnell, A. Wiley, M. Reynolds.

COLLEGE OF DENTISTRY, UNIVERSITY OF ILLINOIS.

Graduates, 1906.—M. F. Bloomenstiel, E. N. Brady, M. D., B. J. Bronstein, F. E. Clinite, G. T. Coleman, M. D., C. G. Cree, E. H. Danforth, L. B. Desser, J. H. Dyblie, H. H. Ertel, J. C. Frey, W. W. Gill, O. W. Helmick, W. H. Holden, J. A. Jent, O. F. Landon, F. Lotreck, R. L. Marquis, C. W. Marsh, C. J. Mason, H. C. Mauermann, L. Miller, C. B. Meeb, J. O. Mortenson, R. R. Mundell, T. M. Nelson, J. H. Plummer, G. A. Preusker, J. A. Rockfellow, W. J. Rogers, W. H. Shaffer, E. L. Simmons, C. G. Stocker, E. E. Taylor, W. B. Tym, W. Thompson, V. J. Vita, T. R. Walker, G. B. Waterman, W. A. Wimmer, C. A. Worthington, S. L. Worthington, J. A. Wright.

ROYAL COLLEGE OF DENTAL SURGEONS OF ONTARIO.

Graduates, 1906.—S. W. Bradley, E. C. Jones, G. B. New, W. J. Price, J. W. Clay, E. H. Wilson, G. M. Garrell, F. A. Fallis, G. F. Roulston, F. A. Axon, C. Pritchard, E. Kelly, W. R. Glover, M. A. Day, A. V. Lester, G. B. Tovell, F. A. French, W. C. Smith, D. W. Massey, E. A. Wessels, W. H. Doherty, F. C. Becker, W. H. Reid, H. L. Watt, W. H. Geddes, G. Wilson, J. A. Beatty, E. E. Bruce, A. R. Shapells, Margaret Gordon, J. T. Hackett, A. R. Jordan, H. A. McKim, N. S. Coyne, A. S. Elliott, E. A. Grant, C. B. Stover, C. A. Mills, R. McGill, H. W. Baker, J. A. Bothwell, H. M. Reid, E. B. Sparks, F. L. Heath, B. W. Linscott, J. E. Middleton, J. M. Deans, L. T. G. Smith.

OHIO COLLEGE OF DENTAL SURGERY.

Graduates—W. F. Baber, Montgomery, W. Va.; G. P. Bannister, Sherman, Ky.; E. F. Bohn, Newport, Ky.; F. Bryan, Dublin, Texas; A. J. Clark, Cornwall, Canada; J. B. Collins, Celina, Ohio; H. M. Cormany, Hartwell, Ohio; C. Cornish Jr., Puebla, Mexico; W. L. Cottle, Matville, W. Va.; A. Crawford, Duart, Canada; C. E. Deardorf, Los Angeles, Cal.; G. J. Eisman, Parkersburg, W. Va.; V. W. Emanuel, Milnor, N. D.; B. W. Fesler, Chickasha, I. T.; H. R. Garst, Dayton, Ohio; J. R. Garst, Dayton, Ohio; I. Hook, Red Oak, Ohio; W. Kidd, Matville, W. Va.; J. C. McKee, London, Ky.; H. Mammon, Huntington, W. Va.; F. C. Nerish, Cincinnati, Ohio; H. Shumate, Oak Hill, Ohio; R. Shumate, Marshes, W. Va.; R. C. Stamper, Owenton, Ky.; F. S. Stilwell, Dayton, Ohio; H. G. Swertfager, Utica, N. Y.; E. B. Williams, Utica, N. Y.; C. V. Yaple, Chillicothe, Ohio; S. N. Young, Caldwell, Ohio.

CHICAGO COLLEGE OF DENTAL SURGERY.

Graduates of 1906.—J. A. Alrick, W. E. Aaron, C. E. Allen, H. W. Allen, J. L. Ambrose, J. S. Alexander, R. E. Barber, G. E. Bolsinger, E. S. Best, G. C. Boudreau, H. W. Burgess, W. B. Cary, T. J. Cassidy, H. R. Clark, S. J. Clark, J. W. Coram, E. D. Coolidge, L. P. Cummings, A. E. DeRiemer, R. O. Duguid, J. R. Duncan, S. G. Dolby, G. D. Elmer, A. G. Emerson, W. V. Fallis, W. T. Fitzgerald, T. A. Goodridge, G. E. Godfrey, T. L. Gilbertson, S. M. Gibbs, A. P. George, R. S. Hall, E. C. Hanson, T. C. Hansen, J. B. Hardison, J. E. Hajicek, W. E. Hocking, S. Ibuka, A. G. W. Jensen, J. T. Knox, H. C. Kaschau, P. O. Keenan, E. B. Knights, G. W. Lausted, J. B. Lape, F. C. Lange, R. D. LeFebre, W. B. Le Argent, W. H. McKelvey, A. R. Miner, L. M. Mahood, J. C. Mortonson, J. H. Muntendan, C. D. Midkiff, W. R. Parr, C. W. Peterson, L. A. Platts Jr., W. W. Peebles, E. H. Raedel, H. Rosenberg, C. E. Schmidt, C. H. Selleck, J. Seegmiller, E. G. Skiff, M. R. Stover, W. M. Stoner, D. L. Sullivan, J. M. Sinclair, G. R. Treiber, W. W. Taggett, W. E. Thomas, M. M. Voorhees, R. R. Vasumpaur, R. E. Wilson, E. M. Woolley, L. T. Weinshenker, J. L. Wildber and H. I. Williams.

THE

DENTAL REVIEW.

VOL. XX. CHICAGO, AUGUST, 1906. No. 8.

HERBST BURNISHER.*

BY J. R. CALLAHAN, D. D. S., CINCINNATI, OHIO.

"Here comes one with a paper,
God give him grace to groan."

And he dares to select for his subject a simple little inoffensive instrument that has been tried and found wanting—many years ago—found wanting when used for introducing gold into a tooth cavity.

The steam locomotive was primarily a steam engine for pumping water. Adapted to a new end, while not a failure as a pump, yet that pump entered upon a broader field when adapted to other uses;—so with the rotary burnisher, I believe it to be a very useful instrument when put to other uses than that of consolidating pure gold.

Those of you who were in practice about the year 1884 will remember that Drs. Black, Bödecker and Rehwinkle brought to the attention of the American dentists the method of Dr. Herbst, of Germany. A number of us gave the rotary burnisher a trial, but soon went back to our previous methods, taking up with renewed confidence our various forms of mallet pluggers, and rotary burnishers passed into history as a failure, and by a majority of dentists forgotten.

About this time I was using in an experimental way, as a filling material, to take the place of amalgam, a combination of tin and gold. Amalgams, even the splendid alloys that we now have, fail in occlusal cavities at the edges, because they are brittle so that the frail, thin edges that we are sure to make will chip off like porcelain, will not bead under pressure and lie close to the cavity borders.

Now, when you try to force gold up to the cavity border with a burnisher, the more you burnish the less likely are you to get a tight joint. A. H. Hirous, in his work on metaleography, says the microscopic structure of pure gold shows well defined large crystals with sharp angles, being found native in this form.

---

* Read before the Chicago-Odontographic Society, March 20, 1906.

If a metal naturally assumes a crystalline structure, the molecules which are the component parts of matter probably assume a definite shape and arrange themselves in contact with each other so as to form larger crystals of the same shape, and the slower and more uninterrupted the action the larger will the crystals grow and the more symmetrically will they arrange themselves in relation to each other.

If a metal is submitted to pressure, not only will the individual crystals be distorted, but the orderly arrangement of the whole mass will be disturbed, and when the pressure is carried to a certain extent the metal becomes rigid—a state of unstable equilibrium being brought about.

Now, in all probability the natural crystalline condition is the stable condition, and any deviation from this may be said to be unnatural. In such cases the molecules are ever tending to pass back again to the normal and the more highly crystalline state, which is perfectly effected by remelting, and often in a great measure by annealing.

It is this disturbance of the natural crystalline structure of the gold that destroys the working qualities of the gold foil under the burnisher, and, to my mind, is why the Herbst burnisher is not a practical instrument for the introduction of gold foil into a tooth cavity.

The interposition of sheets of tin foil between the sheets of gold foil seems to overcome, to a degree at least, this distortion of the natural crystalline structure of the gold, and gives us a workable mass that will not draw away from the borders, but will burnish up close and remain close to the cavity walls.

This is my only reason for combining the tin with the gold for filling purposes. This spreading quality is especially noticeable under the rotary burnisher. In fact, if a large four-wall cavity (tonight we refer to no other cavity than the four-wall cavity), such as we fill on buccal or occlusal surfaces, be half filled with tin and gold, equal parts, and the Herbst burnisher, in motion, pressed into the center of the filling until a pocket be made in the metal, then by forcing the burnisher around and around this pocket the metal may be forced up and around the walls of the cavity in a most wonderful way, and it will be dense, reasonably strong, and fill every crevice and will hug the borders, producing a most perfect joint.

My experiments were for the purpose of getting as little tin in the filling as possible. Without referring to the many experiments I have made, or quoting from the records, I will mention three formulas that have given the best results:

The gold used is Abbey's noncohesive, No. 10.
The tin is the S. S. W. extra tough tin foil, Nos. 10 and 2.
Sheets placed upon one another in the order named:

Formula A:

No. 10 gold } Gold and tin in equal parts,
No. 10 tin } folded and cut in strips.

Formula B:

No. 10 gold }
No. 10 tin } Gold 2 parts, tin 1 part,
No. 10 gold } cut in strips or ribbons.

Formula C:

No. 10 gold }
No. 2 tin } Gold 10 parts, tin 1 part,
No. 10 gold } cut in strips.

Using the light numbers of any foil is to me unsatisfactory because they will break, tear or crumble more or less under the plugger points. Nor do they produce a filling so solid as will foils from Nos. 10 to 60. The heavier numbers drive ahead of the instrument and, for me, produce better results.

After trying every brand of foils known, the Abbey gold and the S. S. W. extra tough tin foil have proven themselves to be so far superior for this work that it is not worth while to discuss other makes in this connection.

For children's teeth, or other wholly or partially submarine work, Formula A is to be recommended. No amalgams will work easier and no filling of any material whatsoever will approach it as a tooth-saver under like conditions.

I am and always have been strongly in favor of having perfectly dry cavities, but when I see these fillings that have been put in under saliva and have saved the cavities from further decay from childhood to manhood or womanhood, and still in perfect condition today, by the score, and many other fillings in the same mouths needing renewal, I must confess that I can not dispute the theory of Miller—I think it is he who says, virtually, that moisture is at least no disadvantage in the presence of tin-gold.

For cavities that are not too conspicuous or or do not present unusually broad surfaces to forces of mastication, Formula B is to be chosen. This is perhaps the best combination for buccal cavities.

On occlusal surfaces this proportion of gold will maintain a fairly good color, and wherever used, except for contour work, is superior to any amalgam, and can be put in and finished in the same, and most likely, less time.

In cases where color is a consideration, or where a large part of the occlusal surface is involved, Formula C is to be preferred. This combination will be found to work a little stiffer than the other formulas, yet it works quite easy and spreads well under the plugger and burnisher, and when properly finished shows a color of about eighteen or twenty-karat gold. And on occlusal surface will *keep* the gold color, and make a filling that will stand wear well.

As to methods for placing the filling materials in the cavities, the floor of the cavity should be as flat as possible to have it and walls slightly beveled.

Use the old-fashioned hand pressure and wedge points for small or medium sized cavities. For large cavities the Bing pluggers and method.

After the filling material is in position and the cavity more than full and pressed home with the large round points, then go over the surface of the filling thoroughly with steel Herbst burnishers.

This will press the metal down solid and spin it out to the walls; in fact, if thoroughly done, will so solidify the gold and tin that the next instrument will cut instead of tear the foils.

Then dress the filling down with large cross-cut burs that have had all the sharp edges reduced by running the butt on sandpaper. This is the most important burnisher in this work. These burs will cut the filling down and at the same time assist in solidifying the mass, and will not cut the tooth.

After this bur has cut and burnished the filling to proper shape, use again the Herbst burnisher, being careful at all times to run all rotary instruments as nearly as possible toward the cavity walls.

Finish the filling, using stones that have been dipped in pumice in the same manner that we use polishing points. Follow this with the leather points and pumice.

This gold color does not appear until this stage of the procedure. The final polish is as important in this as in any other filling.

INLAY MATRIX.

No doubt most of you have trained yourselves to a more or less satisfactory method for fitting matrices to inlay cavities. However this may be with you individually, to those who have not already done so I strongly recommend the rotary pressure for this work.

My own mode of procedure is as follows: First press the metal, gold or platinum, as the case may be, to the floor of the cavity with spunk or cotton, bending the protruding metal parallel to the walls.

Then replace the spunk with gun-camphor, then with rotary burnisher direct, or right angle, as large as will go well into the cavity; force the metal up to the cavity walls; remove and anneal; replace in cavity, pack not over full with camphor, bend protruding metal back over edges of cavity, not close, but sufficient to enable you to draw a strip of linen over the tooth, covering camphor and metal, holding linen just tight enough to retain metal and camphor in place. With same burnisher force metal well up to walls all around, finishing with a burnisher that is small enough to go into all angles or grooves.

Never allow burnisher to touch the metal. Remove and after burning out the camphor, fuse enough porcelain in the matrix to cover floor, or enough to fill cavity one-third, then replace in cavity. Fill with camphor, replace the linen strip as before, only draw it and hold *tight* to place. Then with small rotary burnisher burnish over the edges thoroughly, being careful as before to not permit the burnisher to touch the matrix metal.

With a little practice you can in this way make a perfectly accurate fitting matrix with less puncturing or tearing and in less time than I am able to do in any other way known to me. The same procedure can be followed on a model.

AMALGAM FILLING.

Somewhere about 1895 or 1896 the great work of Dr. G. V.

Black in amalgams was made known. Since that time the manufacturers have been giving us alloys of which a very excellent tooth-saving filling can be made. Permit me to emphasize the word "can," for I believe that it requires skill and effort to make a good amalgam filling, and I believe that there are more dentists in this country who can make excellent gold fillings than *do* make even fairly good amalgam fillings. This is entirely the fault of the individuality of the operator.

Barring color and chipping of amalgams along frail edges, alloy fillings *can* be made that are the equal of any other filling material known to us today.

With the advent of the "quick-setting, warranted never to rip, fade or shrink" alloys we all have been able to make fillings that are in every way superior to the older formulas. Thanks to Dr. Black.

After having used the newer alloys about one year, in a few of my fillings (thank heaven, only a few!) small crescent-shaped cavities appeared along the margins of three or four fillings that were otherwise perfect. These cavities did not appear to be of a recurrent nature, were in no way connected in the earlier stages with the interior of the cavity, but superficial, showing the characteristics of incipient decay on approximal surfaces when the breaking-down process has not gotten beyond the enamel, to an appreciable degree. In an effort to determine the cause of the condition, the tooth and filling were carefully washed and dried and examined with a lens. Several small spots or specks were noticed on the face of the filling, one of these specks appearing on the border of filling corresponding in position to the cavity, the first cavity examined being about one mm. in diameter. The defect in filling was about one-half mm. in diameter. Other decayed specks that were not over half mm. in diameter, and so on.

Other cavities had become quite large before they were discovered.

Visions of the copper amalgam fiasco began to develop, and an investigation seemed to be in order. So an effort was made (not very scientific and perhaps you will think of but little value), and I may be showing a lack of judgment, or may be taking my ideas too seriously, when presenting this matter here in Chicago, the very center of the dental activities of the world today.

About 100 specimens have been made. Cavities were cut in extracted teeth, also in blocks of vulcanite. All kinds of alloy fillings were placed in these cavities.

Thin mixes, dry mixes, hand mixes, mortar and pestle, hand pressure, mallet pressure, rotary pressure, hand burnishing—all were used. In fact, every alloy and every method of placing fillings was employed.

These specimens were ground flat on as many sides as possible, so they would lay flat on the microscope. After being ground flat the metallic surfaces were polished by rubbing on ground glass with moist pumice stone.

Examination shows these alloy fillings to be filled in varying numbers with minute cells, globular in shape, from a millimeter in diameter down to dimensions invisible, having much the appearance of minute bubbles to be seen in a quickly or over-fused piece of porcelain.

Slide 1 shows the surface of a contour filling that to the eye alone shows a perfect surface. Under a one-inch lens, however, numerous small round cells are plainly to be seen at various points on the contour. The group of cells shown in the drawing are about one-tenth to one-twentieth mm. in diameter. Some of the smaller cells are located along the borders of the filling. They were not noticed in time for the drawing. Another defect, more noticeable than the cell, is also noticed. Folds or joints where different pieces of alloy have not been thoroughly united with that already in the cavity. This condition, of course, is brought about by faulty manipulation.

Slide 2 shows an old filling in an extracted molar. The largest fissure measures two 2 m. m. across and about one-half m. m. in depth, and extends half way across the tooth.

So now we have two kinds of defects under observation, the cells and the fissures. As said before, the fissure cavities we charge to faulty manipulation, and at first glance one would think this sort of defect could easily be eliminated. I have not found it so.

In the scores of test fillings in my possession fissures will appear at most unexpected points when any other than a rotary burnisher is used for the plugger.

Of course, a filling can be put in by hand pressure that will be free from folds or fissures, but the per cent is decidedly against that method.

Slide 3 shows a contour alloy filling that was put in by hand pressure, and an effort was made to make it perfect as possible, but you see a good sized fold or crevice appears in the mass and comes dangerously near the buccal wall. This crevice at the broadest portion measures about one-half m. m., the finer extension toward buccal wall being about one-twentieth m. m. How much farther it may have extended toward the buccal wall no one can tell, for in working hard specimens one never knows what has been lost in cutting down surfaces.

When it comes to accounting for the minute round cells I am at a loss for an answer. Perhaps many of you investigators in Chicago are perfectly familiar with these conditions. If so, my inquiry will not be in vain, for I should be glad to know more about them.

To some a cell that measures but the twentieth of a millimeter may seem to be absolutely harmless, but when we remember the size of the microbes that are active in bringing about decay in teeth, one can readily see what magnificent shelter a cell that measures one-twentieth of a millimeter would be for a lactic acid germ that is from 1 to 1.7 micro-millimeters long by 0.3 to 0.4 micro-millimeters in thickness. Quite an active community could set up housekeeping the first day, with abundant park space in which the little lactics could play at pulpitis. But fortunately these little cells appear at the cavity margins less often than they do elsewhere in the carefully constructed filling. In this respect the advantage is almost as a hundred to one in favor of the rotary burnisher.

Slide 4 is an inferior molar tooth with a large contour amalgam filling in place. The surface of this filling seems to be free from defects except on the buccal surface there appears, when magnified ten diameters, a little group of cells, the largest cell measuring about one-fifth m. m., the others being about one-quarter as large. This is a rotary filing.

No. 5 is a hand pressure filling showing fissure and cells—a very bad case.

No. 6 is an exceptionally bad case of hand pressure. Nos. 7 and 8 are blocks, each showing two filings; one filling shows a perfect surface and the other shows defects, the perfect surface being put in place under rotary pressure.

No. 9 slide .

Slide 10 shows section of molar tooth that had an amalgam filling with no protecting substance between dentine and metal. The resultant growth or thickening of pulp chamber wall is a familiar picture to you all, and it is the practice with most of you to place cement under all fillings where possible.

In just this kind of case the Herbst burnisher works to great advantage. Partially fill the cavity with a rather thin—a little bit thicker than for inlay work — of medium quick setting, sticky hydraulic cement. Then place a good sized ball of alloy in the cement and begin in the center of alloy to burnish toward floor and walls of cavity with medium sized rotary burnisher, running quite slowly.

The cement will always travel ahead of alloy, leaving a silvered surface where in contact with the burnisher; burnish tight up against all margins. Then remove all extruded cement and alloy from about margins. Put matrix in place and finish a la Herbst. At first you will most likely force *all* the cement out of cavity—not all, but the protecting layer over pulp chamber. Experience will correct this.

By this procedure you will have so firmly united tooth, cement and filling that it is difficult to separate them, besides the saving of 75 per cent of time in the introduction of the cement.

To test this: Grind a cavity in an extracted tooth. Have no retention whatever (for the test only), except flat floor and fairly angular walls. Place filling as above; after amalgam and cement have thoroughly set force the filling from the tooth with an excavator.

Use an old excavator; you might possibly break a good one.

HARMONY.*

BY T. P. DONELAN, D. D. S., SPRINGFIELD, ILL.

Mr. President, and Gentlemen of the Sangamon-Menard County Dental Society:

Music, painting, sculpture, all the arts that tend to please the eye or ear, would fail were it not for harmony. Dentistry has taken its place along with the higher arts, but owing to the uses the teeth are subjected to the universal application of that material which seems at present best fitted for harmony is precluded.

---

* Read before the Sangamon-Menard County Dental Society, February 9, 1906.

Some years ago, after matured reasoning, I decided that I was intended for a dentist. If I were a woman, it might have been very well, but as I am not I am daily filling my shoes with sweat endeavoring to convince some of my patients that I have not missed my vocation and married into the wrong profession.

When first graduated from the dental school I, like the thousands other graduates, might have exclaimed with Dante, "In the middle of this our mortal life I found me in a gloomy wood astray," for the dean and his assistants had worked so hard to make me a dentist that they forgot, or at least neglected, to give me a dental compass in the form of a fee-bill. Perhaps they agreed with the Chinese that there are two things the American youth does not have to be taught, namely, lying and how to get money.

So when the minimum fee-bill came up before this Society last winter I believed that the Mecca which I have long looked forward to was close at hand. The discussion which it caused must have had a good effect on nearly every one present, and did no harm to anyone, but I am now thoroughly convinced that we acted wisely when we refused to adopt a compulsory uniform fee-bill. I wish to state here that this paper received its name and inception from the remarks made by our ex-president, Doctor Lambert, who, when putting the question before the meeting, stated that, "whatever your actions may be, gentlemen, harmony must prevail." Gentlemen, can you imagine any one thing more inimical to good fellowship and peace of mind than a uniform fee-bill? With our methods for the same operations in many cases so different; with different ideas as to what would be best for a given case; with a patient frequently incapable of understanding the nature of the operation going from one office to another and honestly or designedly misrepresenting the different offers made; with a suspicious public always alert for anything that looks like a combine; with unprincipled practitioners ever anxious and willing to quote or misquote that they may gain; with those sometimes coming to us whom we judge poor and deserving; those whom we call personal friends; and those to whom we extend professional courtesy; with frail human beings for dentists, born with passions the same as other men, to love, to fear, to hate, would it not be surprising if we did not lower the dignity of our profession and by unwarranted suspicion create "an opposition that did not exist?" With these conditions ever existing among us, can you see, think, or hear, of any one thing more prone to sow universal discord in a dental society than a compulsory uniform fee-bill?

But, as I stated before, it was good that it came up, and I do not think it would do any harm to have it read at the January meeting each year. New members would become acquainted with the fees usually charged, and if they suited them they could adopt such a fee bill or make changes best suited for their individual needs. To have made it compulsory and expected us to live up to it would have been absurd. Dentistry is a progressive profession, ever alive to anything new that will elevate its standard, or assist in bettering conditions for the relief of a suffering mankind and to beautify—if possible—womankind. With every new idea that has or may come into general practice will also come a difference in fees. Each one must reason and act for himself. "All beer would be port if it could." In a growing city of 60,000 people with wages varying from $3.00 a week to $5.00 a day, I don't believe it possible that all beer could be port if it would. But as the artist playing on the organ, using both the high and low notes produces beautiful tones, so should we be philosophical enough to accept the inevitable and unite all the parts together in one harmonious whole.

I do not wish to appear egotistical or over optimistic, but I venture the assertion there is no section in this State or country where the spirit of "live and let live" is better exemplified among dentists than it is here. This, I believe, is noticeably true in respect to one another's patients. True, occasionally some bad boy hits my boy, but his father comes in the next day and says that he understood that my boy hit his boy first. One of the worst lickings my boy ever got—that I heard of—was when a young man accompanied by his mother applied to a dentist to have his teeth examined. It appears that some one else had recently extracted a crowded cuspid for the young man. This dentist, upon seeing it, immediately began condemning the man who would perform such an operation. Said that the young man's features would be marred for life, etc. After orating for about five minutes he asked the mother, by this time much bewildered, who did it? She answered, "Dr. Donelan." Meeting the Doctor later, he wanted to know why I extracted the cuspid. I explained to him that while I knew the parents of the boy, they had never been in my office. Sherlock Holmes like, he began looking for the man who pulled that cuspid. He afterwards told me that he learned from the father of the boy that some else had extracted it. He apologized to me for what he had said to the parents and also intimated that in the future he would never criticize before the patients the work or operations of any other dentist. That surely is a good resolution, and I believe the Doctor will keep it.

Arriving at my office a little early one morning—I would be early every morning if my patients would make me—I found a shopper waiting for me. She wished to inquire about having a plate made. I gave her the information she wanted. When she left it was to go direct to another dentist's office, make the same inquiries, and wound up by telling him that she had been to see me, but that she did not think much of me as I had formerly been a shoe clerk, to which the dentist replied: "Madam, I am a farmer's son, and myself have followed the plow." There was one slap in the face Doctor F. saved me. "May his shadow never grow less."

Shades of the immortal Chapin Harris, what must that man have been thinking about when in this porcelain age he placed that gold crown upon a lateral incisor, was the way Doctor L. told me what he thought, as a patient for whom I had crowned a tooth presented himself to him for temporary relief. In the course of conversation he asked the patient why he had not had a porcelain crown placed there the same as was on the lateral on the opposite side, to which the young man replied that the white one had broken off so frequently that it had become very annoying as well as expensive, and now that he was married his troubles were increasing rapidly enough and that he did not propose to invite any new ones. After closer examination, the Doctor agreed that porcelain was contra-indicated in this particular case, and then to show the patient what a high regard he had for my judgment, confided to him that he honestly believed that I could work and place copper amalgam as good as any man in this city. This is apologizing with a dark boy, but as a true professional man knows neither color nor creed, I accept it.

A lady patient for whom I extracted a number of teeth, preparatory to making an upper denture, and to whom I had told she might expect trouble in wearing a plate, owing to some conditions that existed, accompanied a lady friend to her dentist, and while there inquired as to the feasibility of wearing a denture. He so strongly impressed upon her mind the necessity of patience and perseverance that after I had made the plate and she had worn it for some time she came in and told me what she had done, and said that if he had not given her that advice she did not think she would ever have mastered that plate, and I agreed with her. Gentlemen, it is acts of this kind that educate the public and lighten the load of dentistry. This advice was given to a stranger coming from a strange dentist. He surely followed the Golden Rule. I mention these incidents to show to the unbelievers that harmony is possible and does exist even in a dental society; and whatever your discussions may lead to, when you go to your offices tomorrow, let your motto be that of the three guardsmen, "All for one and one for all." In conclusion, I wish to read to you an extract from Dr. Zahm's Book on Evolution:

"To the theistic evolutionist all is instinct with invitation to a higher life and a happier existence in the future. All is vocal with hymns of praise and benedictions. Everything is part of a grand unity betokening an omnipotent Creator. All is foresight, purpose, wisdom.

"We have the entire history of the world and of all systems of worlds 'gathered as it were into one original creative act, from which the infinite variety of the universe has come and more is coming yet.' And God's hand is seen in the least as in the greatest. His power and goodness are disclosed in the beauteous crystalline form of the snowflake, in the delicate texture, fragrance and color of the rose, in the marvelous pencilings of the butterfly's wing, in the gladsome and melodious notes of the lark and the thrush, in the tiniest morning dew-drop with all its gorgeous prismatic hues and wondrous hidden mysteries. All are pregnant with truths of the highest order and calculated to inspire courage and to strengthen our hope in faith's promise of a blissful immortality."

* * * * * *

"As the musician, having tuned his lyre and harmonized together the high with the low notes and the middle notes with the extremes, makes the resultant music one, so the wisdom of God, grasping the universe like a lyre, blending the things of air with those of earth and the things of heaven with those of air, binding together the whole and the parts and ordering all by His counsel and His will makes the world and its appointed order one in fair and harmonious perfection; yet He, Himself, moving all things, remains unmoved with the Father."

BAKING PORCELAIN WITH PARTITION WALL.

BY C. M. BALDWIN, D. D. S., CHICAGO.

The more or less crude methods used to ascertain the temperature in the muffle have not given uniformly accurate results.

Undoubtedly the pyrometric furnace will remove much of the guess work that heretofore has played so disastrous a part in the baking problem.

Any satisfactory method of baking must be capable of guarding against those comparatively slight changes of temperature immediately surrounding the porcelain, that may be sufficient to ruin an inlay or crown, but may not always be detected by the operator until the piece has been removed from the furnace. This protection must include those changes caused by the fluctuations of the electric current.

A method that has proved very satisfactory to the writer was published in THE DENTAL REVIEW, December, 1904, and February, 1905, wherein details of experimental work were given. This paper will be confined almost entirely to the practical application of the method.

The *relative heat position method* is very simple and should be easily applied to the open end furnaces so generally used. The Hammond No. 1 and No. 2 and the Custer No. 8 are examples of this class.

Different sections of this form of muffle are so unevenly heated that any of the high fusing porcelain bodies may be baked perfectly, at the instant that a No. ¼ gold cylinder melts, if they occupy their proper relative heat positions.

PARTITION WALL.

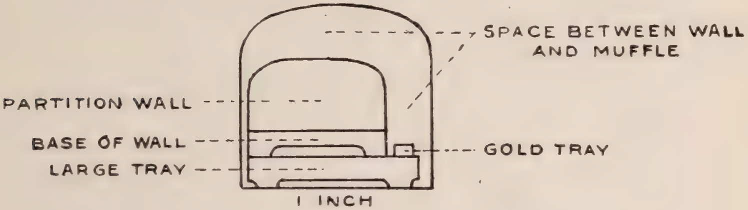
A small partition wall is used that aids materially in the baking and eliminates many of the positions that otherwise would be necessary.

The wall is used when all high fusing bodies other than Brewster's XX are baked. (See DENTAL REVIEW, February, 1905, pages 111, 112, test No. 1.)

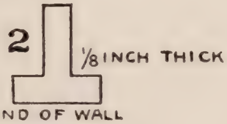
The diagrams on page 773 show the different views of the wall, its position in the muffle and their relative sizes.

A large *fire clay* tray covers most of the floor of the muffle and supports the wall and the trays for the porcelain and the gold. The wall and small trays are cut from a one-half inch square soapstone

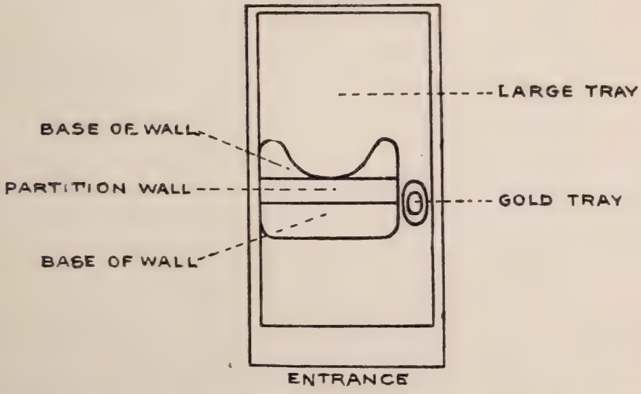
Nº 1



Nº 2



Nº 3



stick. It is not safe to bake at high temperatures with soapstone on an unprotected muffle floor, and it is preferable to have it of the best quality for using about the furnace. The wall and trays should be completely shaped before baking, as it is almost impossible to cut them afterward.

From the floor surface of the front half of the base of the wall trim a small portion to aid one to grasp it with the pliers. (Fig. 1.)

To provide additional space for the porcelain, cut away the inner section of the base of the wall, but leave the projecting ends to prevent the wall from falling over. (Fig. 3.)

Fig. 1 is a section of the muffle as seen from the entrance, showing the elevation of the wall, and the space between it and the muffle. The small gold tray is in the right lower corner, and may also be seen in Fig. 3. Fig. 2 gives an end view of the wall, all parts of which are one-eighth of an inch thick. Fig. 3 shows small tray and wall, on the large tray in position for baking.

BAKING.

Adjust all parts on the large tray before placing it in the muffle, then gradually advance it into the oven until it touches the end wall. The heat may be increased according to individual preference, but when the gold melts to a ball immediately return the lever to the first contact point and open the circuit. So far as possible the conditions influencing the bake should be the same each time, therefore the wall and porcelain should occupy the same positions, and it is best to use but one form and quantity of gold. The wall may be moved toward the entrance when necessary to accommodate the piece to be baked.

GOLD ADJUSTMENT.

The only movement necessary to correctly gauge the temperature to fuse Brewster's enamel (2084°), or Close foundation body (2300°), is a short one either forward or backward between the end of the partition wall and the side of the muffle. (Fig. 3.) The two extreme positions are but a little more than one-half of an inch apart, consequently for indicating any temperatures between 2084° and 2300° the gold would be placed between these positions.

RULE FOR SELECTING GOLD POSITION.

To develop the highest temperature, place gold nearest to the entrance. Move gold proportionately nearer porcelain as lower temperatures are required.

CONCLUSIONS.

1—Where applicable this method may be made to produce accurate results, as the conditions can be controlled by the operator.

2—Fluctuations of the electric current do not make less accurate results, but only affect the time required.

3—The expense for a pyrometer has been reduced to the minimum.

4—The simplicity of the method, together with the lack of frail and delicate mechanism to get out of order, are not the least of its attractions.

5—The strain on the muffle is greatly reduced, because excessive heating is avoided.

6—Any fairly intelligent assistant should be able to complete the operation perfectly after the tray has been prepared for the furnace by having its load properly positioned.

DENTISTS IN PARIS.

BY HORACE WYNDHAM.

Taking it all round the practice of dentistry in Paris is not in an altogether satisfactory condition. One would think that a city that has a world-wide reputation as a training ground for medical men would be the equal of any in Europe where dental science was concerned. Yet this is so far from being the case that Paris is even eclipsed by other French towns in the distinction and number of its properly qualified dental practitioners. Of course there are here, as elsewhere, swarms of enterprising individuals who stick a brass plate on their front door and call themselves "dentists" without having the shadow of a real claim to the title. These quacks—for they are nothing less—do a great deal of harm, not only to their luckless patients, but also to the honorable calling which they thus bring into disrepute. Contrary to what might be thought they do not draw the bulk of their clients from the poorer classes at all. The majority of those who consult them, as a matter of fact, consist of people who can quite well afford the services of a respectable practitioner. By going to one of the cheap-jack pretenders, however, they save a few francs, and there is nothing that the average Frenchman loves better than to do this. His thrift, indeed, is quite extraordinary. At cafés and restaurants, for example, one will see quite prosperous looking individuals unblushingly pocketing matches or secreting lumps of sugar.

One reason, however, why the inferior kind of dentist drives a thriving trade in Paris is because so many of the properly qualified ones demand such extortionate fees. The average Frenchman would willingly endure a great deal of toothache before he would submit to the charges levied by the leading members of the profession. For the simplest extraction a practitioner of repute will demand the equivalent of five dollars, while for stopping, or supplying artificial teeth, he generally asks something like a king's ransom. It is true that he is generally prepared to be beaten down, but it is not everybody who cares to haggle when he is sitting in the fatal chair. All that is then wanted is prompt relief. Of course the high rents that obtain in the fashionable parts of Paris make it necessary to impose fairly stiff fees, but there is a happy medium to everything.

Rue Castiliogne, looking towards the Place Vendome. Some of the leading dentists have their offices here.

A particularly objectionable feature about dental charges in Paris, on the part of the leading practitioners, is that there is no certainty about them. Thus, one day a man may demand ten francs for an operation, and the next day charge another patient fifty francs for precisely the same operation. The dentist is entirely a law unto himself in this matter. He never argues when a client expostulates, but merely shrugs his shouluders. Only a few weeks ago an Englishman, who had an unfortunate experience of this sort, declined to pay a bill on the grounds that it was unreasonable. He went to law about it, but lost his case, for the judge held that the dentist was fully entitled to ask what he pleased. Still, the publicity which the case attracted did not do the dentist much good, and his practice fell off to a considerable extent. One does not mind paying anything in reason, of course, but at the same time one naturally objects to being robbed.

American dentistry, although only introduced within a comparatively recent period, has met with much favor in Paris by all who appreciate high class work carried out under skilled conditions. The headquarters of the system are established in the Rue de la Paix. Here there is an exceedingly flourishing institution, which was formed for the express purpose of combatting the fancy fee system that hitherto obtained by adopting a scale as nearly as possible identical with that employed by the leading practitioners in the United States. There is also in Paris an American Dental Club with some thirty members.

Appreciating the fact that American dentistry is deservedly popular in Paris, even among Frenchmen, several French practitioners do not hesitate to describe themselves as "Americans." Of course, they have never seen the sky over the United States, and have never been nearer the country than the American bar at Maxim's. One such enterprising firm is installed near the Madeleine and advertises itself as the "Grand Establishment of American Dental Doctors." In its prospectus (thoughtfully translated into English, German, Spanish and Russian) the following lofty claims are made:

"All the latest improvements in the Dentist's Art are executed by selected Doctors, chosen from the leaders of the last competition which raised the Dental Art to its present high perfection.

"All our work is warranted for 10 years, and our prices are beyond all competition.

"The best guarantee we can give of the perfection of our work is as follows:

"If perchance your tooth, or even your artificial teeth should break, your gold or enamel filling fall out, apply to us and we shall be pleased to repair or replace the *same free of cost.*

"With our improved instruments we are able to do any desired operation without pain, or recourse to anæsthetics.

"The adoption of artificial teeth, with or without imitation gums (invisible even to the keenest eye), are made without fastenings, hooks or springs, and leaves the palate entirely free.

"Roots are not required for our work, but should they exist their extraction is unnecessary.

"The most minute examination of the mouth, within or without, will fail to detect any trace of artificial work.

Rue du Rivoli. A street much affected by high class practitioners.

"It is quite unnecessary ever to extract teeth now we are using the marvel discovered by our Director.

"Application made at each operation positively without danger or suffering.

"We are the sole inventors of tooth enameling. We restore their diamond-like brilliancy to loosened, carious or yellow teeth, and preserve them from decay.

"This process has nothing in common with the ancient system of enamel incrustation of the teeth.

"The remarkable process of enameling the teeth, natural or artificial, is registered and is our exclusive property."

The firm also lays itself out to "cure instantly the most violent griefs of the teeth."

The ordinary scale of charges imposed by a Parisian dentist who does not pretend to be a fashionable practitioner, are very much as follows: Complete set of artificial teeth, from 60 francs; simple extraction, without anæsthetic from 3 francs; with anæsthetic from 6 francs, and stopping from 12 francs. For visits to the patient's house double and treble these fees are demanded.

A typical dental establishment.

It is either on the boulevards, or in their immediate vicinity that most of the Parisian dentists have their offices. A place where they specially congregate is the boulevard des Italians, but there are also a good many others round the Opera Square, and in the Rue de Rivoli, so as to be near the big hotels. The ultra fashionable practitioners usually betake themselves to the residential quarters, such as the Avenue Champs Elysées, the Bois des Boulogne and the Parc Monceau, etc. On the opposite side of the Seine humbler establishments and cheaper prices prevail. This is especially the case in the celebrated Latin Quartier where—if one be so minded—one can have a dozen teeth extracted for nothing, the experience derived by the practitioner being considered sufficient payment. A good deal of open air dentistry goes on in this district, and several alleged "dentists," whose only stock in trade consists of a pair of forceps, a muscular right arm, and a flaring naphtha lamp, drive a roaring trade in the market places every Saturday night. Rough and ready as is their treatment, it seems, however, to be fairly efficacious, for no patient ever consults them a second time.

REMINISCENCES OF FORTY ODD YEARS OF PRACTICE.*

BY J. N. CROUSE, D. D. S., CHICAGO, ILL.

Through several communications which I have received recently relating to things past and present, the thought has been suggested that it might be interesting to go back forty years and review the way in which dental education was attained and dentistry was practiced.

At that time when a young man conceived the idea that he wanted to become a dentist he made application to some practitioner to become a student in his office. And what the student acquired in the way of an education in six months or a year often constituted all the qualifications he possessed when commencing the practice of dentistry. However, this was not always the case. Frequently a position under a tutor in an office was only the first step preliminary to entering college. This tutorship, by the way, had some advantages that are lacking now, in that when a young man entered an office, if the practitioner had sufficient integrity to be truthful to him, he would give him advice as to whether he would make a dentist or not. The writer can call to mind several instances where a young man after entering an office and remaining a few weeks, or months at most, was advised to abandon the idea of becoming a dentist and to take up some occupation which would enable him to make a living more successfully than the practice of dentistry, being totally unfit in natural endowments for the duties of a dentist. In other cases a young man having read text books in an office for a few months then entered one of the colleges, a few of which were in existence at that time, and two courses of four months each were required before graduation, although five years' practice was equivalent to one course. The equipment and facilities of these schools as compared with the schools of today were very meagre. In the oldest and best equipped schools there were not operating chairs enough in the clinic for the students to have the use of one more than every other day. The teachers in the capacity of demonstrators in the clinical department were very few also, there being but one demonstrator for the whole class, so that it became necessary for the beginner in the first course to get instruction when he could from the more advanced students. The contrast between the lectures given at that time and now would probably not show so great a difference, but the present equipments and even the corps of teachers are so much greater now than they were then that the comparison would indicate that a graduate from a dental school now, other things being equal, should be far superior in training to enter our profession than in the years to which we refer. The contrast between the equipments and methods of practice of that time and now are very great. It will be remembered that there were no dental engines. Hand drills, hand excavators, chisels; and the separating file especially was an important part of the outfit. Napkins and bibulous paper with tongue holders constituted the method of controlling the saliva while the filling was being inserted. The changes from this condition to more complete equipments were very rapid after the rubber dam was discovered and brought to notice first by Barnum. By a chance the writer was one of the first to receive instructions from Barnum himself in '64 or '65. It occurred in this way. I had been trying to devise some better method of shutting off the saliva and was trying to accomplish this with oiled silk, waterproof cloth, etc., not knowing that there was such a thing as sheet rubber. Barnum, having applied for a patent, came early to see what I had been doing and thus it was that I received early instructions in its use and value. This made it possible for me to be the first to demonstrate its usefulness to the students in '66 and '67 in their second course in the Pennsylvania College.

---

* Read before the Illinois State Dental Society, May, 1906.

In the year '70 the first dental engine was brought into notice. It was constructed with two fly wheels propelled by an exhaust bellows, which turned the shank of the handpiece. Barring the defect in the handpiece itself, it constituted a very good dental engine. This was brought to the dental profession by George F. Green, of Kalamazoo, Mich. Having disposed of this device on unfavorable terms to himself, as he thought, he conceived the idea of bringing out one run by electricity, and the writer is now in possession of the first electric dental engine that was ever offered the profession.

Following close upon this came the different cord engines, mallets, etc. Thus equipped with these useful devices, the greatest of extremes in methods of practice followed. The permanent separating of teeth with V-shaped separations and self-cleansing surfaces as they were called could be done so much more rapidly with a corundum disk revolved by an engine than they could with the separating files that the teeth in the mouths of the patients were mutilated and injured to an extreme now scarcely conceivable. Numerous articles were written upon the subject and a book by Arthur on "Prevention of Decay" in '71. Herein was advocated the separating of teeth even before decay had taken place in many instances. The book was written in an interesting fashion, on which account many practitioners were misled into adopting this vicious practice. The separations between molars and bicuspids thus impaired the mastication of food and destroyed the tissue between the teeth. Having been a victim of this form of operation myself early in life, the separations between my teeth made it almost impossible to get through a meal without removing the impacted food, so that the toothpick became an important factor with me. When I came to practice dentistry this method was not adopted on my part, and early I became a radical opponent of this line of practice and have been a constant student as to the best methods in the care of the interproximal spaces since. I regard it as one of the most difficult things in our profession to know in just what form to leave the fillings in proximal cavities. I frequently leave the final finishing of a filling for some time to see what will be best to do after the teeth have been used for a while.

With the rubber dam, engines, more perfect drills and electrical and mechanical mallets, the use of cohesive gold was carried to another great extreme; and especially in the adoption of heavy gold, No. 60, No. 120 and as high as No. 240 being used by many practitioners to the exclusion of all the lighter numbers and to the exclusion of the non-cohesive gold, the filling being started from retaining pits. The use of cohesive gold brought into prominence a very radical method of practice wherein men often consumed four to six hours in condensing the gold in a large contour or large restoration of lost tooth substance, and yet this kind of practice never required anything like the skill and good judgment that is necessary in the use of gold when combining non-cohesive and cohesive, which, when combined, make the best kind of a filling, and yet men became famous through their persistence and power of endurance in performing these operations. And while beautiful fillings were made by these operators, as a universal practice it was unwise. The men of sense and conservatism gradually abandoned these extremes, and, while sticking to the use of gold, they adopted a conservative course, using the non-cohesive gold for the protection of the walls and edges and cohesive gold to give the strength and bring out the contours. At the same time, another class of men of standing in the profession came out and advocated the abandoning of gold altogether and the using of plastics. This practice was short-lived, but did great harm for a time by misleading the young practitioners.

One of the greatest extremes and one causing greater injury than any yet named was the use of vulcanized rubber for the insertion of artificial teeth. Unscrupulous individuals under the name of dentists would remove all the teeth, at all ages, from the mouths of patients where decay was setting in and insert plates, and to our certain knowledge practitioners in many instances adopted this line of practice to the exclusion of all others. Let me give a little in detail the evils that followed. First, the extraction of the teeth of young people was carried to the greatest extremes; especially was this true in case of young girls, who, in their desire to improve their looks, would have all of the upper teeth and often the lower ones removed and artificial teeth inserted on vulcanite plates. This led to the result that in the course of a few years, in the case of the young, the entire alveolar process would be absorbed, leaving nothing but gum tissue for a ridge, and it happened to be my lot to treat some of these cases when renewal of these plates was required; and the only way that anything like a natural impression of this could be obtained was with very thinly mixed plaster of paris; and this multitude of poor duped individuals went through life in this deformed condition, wearing plates with artificial teeth. It is to be hoped that many of them never realized their full loss. This imposition on the people was carried on quite extensively by a class of men without other qualifications than being able to extract teeth and insert artificial teeth on vulcanite plates. At that time the fee they received was higher than now and it became quite a profitable business.

About this time the Goodyear Dental Vulcanite Company became a conspicuous factor in the dental profession. The Goodyear patent having expired, which was a patent on the vulcanizing of rubber, they got a renewal of the patent on its application to dentistry under the name of the Cummins patent, and, being well organized, they began preying on the dental profession, compelling them to take out licenses and pay royalty on the use of rubber for plates for artificial teeth. To counteract this, funds were raised in all parts of the country and placed in the hands of a committee to carry on a litigation in the way of testing the validity of this patent. This resulted in our being defeated in the Supreme Court. An investigation of the methods employed in this suit proved collusion; that the rubber company paid the attorney employed by the dentists a much larger fee than he received from the dentists, thus securing his co-operation in winning a favorable decision on the validity of their patent. The Supreme Court, on learning the facts, reversed their decision and remanded the case back to the lower court for a rehearing. The dental profession by this time, however, had become so demoralized that it was impossible to raise funds sufficient to conduct the rehearing of the case, and so the dental profession accepted the decision which resulted in their paying royalty running up into millions of dollars and bankrupted half the dental profession, while the patent would not have been worth the paper it was written upon if it had been thoroughly tested in the courts.

To an observing practitioner of forty years, familiar with the many radical mistakes and changes in practice from one extreme to another, the question arises, are we through with our extremes? Let us see. We think that the history of the future will say that we have been led into quite as great an extreme in the use of porcelain inlays as in any of the extremes that have died out and where conservative methods have been adopted in their stead. We are somewhat timid about making this comment when the great army of reputable practitioners are advocating the use and superiority of porcelain over all other materials, almost, even, to the exclusion of gold; but we believe that such radical use of porcelain as has been practiced for several years is a mistake.

We believe the handwriting on the wall at this time shows the beginning of a more conservative use of porcelain inlays; at least we have heard it mentioned within a year by more than one of the best porcelain inlay workers that "It is now generally conceded that large restorations with porcelain is not wise practice." When questioned as to the cause of the change in this respect, it was said that porcelain would not hold; it was too brittle in these large restorations. The question has been frequently asked, "Where should porcelain be used?" We have seen the answer in print from more than one practitioner, namely, "Where it does not come in contact with the occlusal surfaces." That porcelain has its place and that porcelain work is being used skillfully and to advantage we do not dispute, but it has been carried to a much greater extreme and has been much longer-lived than we had ever dreamed it would be. We predict that a much more conservative use of porcelain will be adopted by practitioners generally in the near future and that gold will again occupy the most important place as being the best filling material, and that porcelain will take a second place with wise practitioners. We believe that history will again repeat itself; that after a brief season longer of experimentation we shall return to the methods of former years which were so thoroughly tested and which gave such satisfaction to patients and practitioners alike and such lasting results.

In this limited review of dentistry in the past, of its equipments and methods, I have limited myself to those changes only which were of greatest importance to the entire profession. In the presence of this great Society, as one of its founders, I wish to congratulate and express my heartfelt gratitude to the committee on organization upon the great work they have accomplished. It gives me extreme joy to see so many of the profession of the State united together and working so harmoniously. I know what this Society has done for me and the beneficial influence which it has had upon many others here present. I think I can estimate what this organizing of the dentists of the State will do for the entire profession, for its influence for good will not be limited to Illinois. In fact, in perfecting its own organization, in setting its own house in order, it has quietly, unostentatiously, and doubtless unconsciously, set an example of numbers, of harmony and good will toward one another which can not but have its effect upon the profession at large.

As I have been renewing in memory the incidents and events of the past while writing this paper, a vast number of familiar faces and forms have been recalled, men whom many of us have known and loved; men who helped to organize this Society and who gave faithful service to it for many years. They have passed to the other shore of the river we call death. Shall we say they did not live to see the fulfillment of that which they so desired and which we now see realized? Or, rather, shall we not believe that these liberated souls, with their enlarged vision, see and rejoice in all that has been accomplished; and that while absent from us in body, they are with us in spirit, with their added wisdom and insight influencing and inspiring us to still greater achievements. If this were not true, then creation would be a failure, and we know it is not.

In conclusion, I wish to pledge my support anew to any part of the work which will further the interests of this Society in its onward march.

A PLEA FOR THE MORE CONSERVATIVE USE OF ANESTHETICS, NARCOTICS AND SEDATIVES IN DENTAL PRACTICE.*

BY C. P. PRUYN, M. D., D. D. S., CHICAGO, ILL.

To assist in the alleviation of pain as a life work has always been considered worthy of the highest efforts of a certain number of mankind, from the earliest known history to the present day. The middle of the nineteenth century will always be known as marking an epoch in the achievement of this much to be desired condition, especially in surgery. And while we of the present day can not do too much homage to the names of Horace Wells, W. T. G. Morton and Simpson, the discoverers of the use of nitrous oxide, ether and chloroform, we can hardly imagine how we could get along at the present time without the use of these and kindred agents. But it is the province of this paper to deal with the abuses rather than the rational uses of anesthetics, narcotics and sedatives. The reckless and careless manner in which inexperienced men have used anesthetics in the past has often been more harmful than the shock of the surgical operation. The permanent evil effects of chloroform upon an already weakened heart and arteries, and the irritating effects of ether upon weak lungs and kidneys have often, as you know, been of too serious a nature to justify us in considering the administering of an anesthetic a simple operation. Fortunately, however, during the last few years there has grown up in some of our large cities a class of men known as professional anesthetists, whose specialized work permits of greater proficiency than the general work of the average practitioner. And some surgeons rely wholly upon such men to administer the anesthetic. But even then, with the most scrupulous care, fatal results have sometimes occurred.

---

* Read before the Illinois State Dental Society, May, 1906.

The fact that we are recognizing some of the evils arising from our past methods causes one to think we are improving, even though it be slowly. If one of our dentists should be so unfortunate as to have a fatal case of anesthetic narcosis, and should be called up before the court to answer the questions of a sharp, shrewd lawyer, I fear the average man would not acquit himself with glory, judging from the answers received from candidates coming from different States of the Union to procure licenses to practice dentistry before the State Board of Illinois.

The natural conclusion would be that the subject of anesthetics has not been very thoroughly taught, or, rather, the seriousness of the subject has not made a very deep impression upon the minds of such candidates. Only a very few of them could tell how ether or chloroform are made, or from what they are manufactured, or the efficient treatment in case of an over dose of these drugs; and if this paper should arouse sufficient interest in this subject so that everyone who uses such powerful agents will go home determined to brush up his knowledge of them, so that if called upon before a court of record he might show a familiarity with them under all conditions, this paper will not have been written in vain.

It is generally understood that the highest courts in the land have not passed upon the province of the dentist to administer anesthetics; and some time that will take place; and when it does it is to be hoped we shall be represented by some one who can do credit to himself and the profession of dentistry.

The only safe anesthetizer is the one who always appreciates the gravity of the case in hand, and who feels with each administration that he is taking his patient down very near to the gates of death, and that a little carelessness upon his part may deprive a fellow human being of life, and possibly plunge a whole community in sorrow.

No anesthetic should ever be given without a previous examination of the physical condition of the patient, and then, if the administration is considered advisable, all known restoratives and antidotes should be within easy reach.

It is said that the unexpected always happens; and if a fatality should occur, and the evidence at the coroner's inquest should reveal a lamentable lack of methods, appliances and restoratives, the court would certainly censure the defendant, and probably hold him over to the grand jury or criminal court for further action. Therefore, too great care can not be exercised in such cases.

That old trite saying that "Fools rush in where angels fear to tread," can be applied to the administration of anesthetics, fully as well as to any of the branches of the great healing art. Looking backward for a third of a century, to the time when the undergraduate of little education and experience was the anesthetist in most medical and dental schools, and to the meagre instruction given students on this subject, it would seem that the guardian angels must have been hovering around to prevent fatalities. It is a very responsible position for a man to administer a drug to a patient that will suspend animation for a more or less extended period, with the balance of the scales tipping to the death side. The custom of using the hypodermatic needle to inject unknown quantities of unknown drugs into the gums for local anesthesia is reprehensible. This method has now been employed a sufficient length of time to demonstrate the evil results of such practice. In the first place, it is bad enough to introduce drugs into the human system that we are familiar with, but how infinitely worse is it to do the same with a combination of unknown materials and unknown quantities of the same! We have all doubtless seen cases of serious injury to the jaws from such practice, as well as grave constitutional symptoms that were more or less permanent.

The introduction into the system of septic matter upon the hypodermatic needle in the hands of slovenly operators, and cheap advertising dental establishments, has become so apparent that something ought to be done about it in the interest of the general public's protection. But how to go about it, when such men are properly licensed by the authorities of the State is a delicate question, and one hard to solve.

The enormous increase in the use of the coal tar headache cure preparations that are having such a deleterious effect upon the heart's action of the users thereof calls for strenuous action upon our part in educating our patients to know the evils, so they may take due notice and govern themselves accordingly.

Acetanilid and its kindred preparations, if properly used, have a large field of usefulness, but, if abused, they become engines of mighty destruction.

Of course, there are times in our practice when whiskey or even some of the opium preparations or other sedatives, are invaluable, but too great reliance upon such drugs weakens the patient, both physically and mentally, and it behooves us to be on the alert and to know when to give and when to withhold these dangerous drugs.

Pain is an exalted sensation of a normal physiological process perverted, and the beneficence of pain as a warning is too well known to enlarge upon before such an audience as the Illinois State Dental Society. But the great demand for painless dentistry that we encounter every day is having a very pernicious effect upon many dentists, as well as the general public. And while a state of stoicism apparently devoid of sensation or sentiment is not to be desired, nevertheless, the person who can restrain his feelings under great stress and strain without the stupefying effect of narcotics or sedatives is in a much better condition than the one who has been weakened both physically and mentally by drugs that deaden the sensibilities and render inert one's real strength and stamina.

While cocaine has been a great blessing to mankind, it has also been a great curse, and is becoming more so every day. The facility with which the tooth pulp may be anesthetized and removed, and crown and bridge work substituted for well made fillings and partial plates, affords the dentist an opportunity to display his wonderful skill to the people, and at the same time to reap a rich financial harvest, so that the great majority of the profession have become crown and bridge work maniacs. And now the question arises, what will be the result of all these beautiful gold and porcelain crown and bridge work monuments? Will they stand? Do they stand long enough, commensurate with the labor, nervous strain and expense of their construction? Are the pulp canals always thoroughly treated and filled, so as to avoid future irritation and abscess? Are the bands always properly fitted, so as to avoid chronic gingivitis and recession of the gums, etc., etc.? Are we not ruthlessly destroying a great many pulps that might better be saved, because it is so very much easier and quicker than the conservative method? And in this wholesale pulp destruction, are we not doing our patients permanent harm while doing them temporary good?

I have seen so much injury to the gums, alveolar process and bone, resulting from hypodermatic injections, that I would prohibit the use of cocaine in my office if I thought the trouble arose from the use of cocaine *per se*. But I am of the opinion that the trouble frequently comes from septic matter carried into the tissues beyond by the needle rather than by the irritating properties of the drug itself. A thoroughly aseptic needle may, and often does, carry infectious material from the mouth into the tissues, and thus cause serious trouble. It is a well known fact that infectious material in the mouth, and about the necks of the teeth, is often carried into the general system by the beaks of the forceps in extraction, causing serious trouble. It is also well known that cocaine is a very unreliable drug in its effects upon different individuals. But its injudicious, indiscriminate and improper use has doubtless caused a very large part of the trouble that has been blamed upon the drug itself.

In the early days of cocaine a large series of experiments were made upon some of the lower animals by one of the members of this Society, that has been of great value to all who use this drug on the human subject.

The one special point brought out in those experiments was that cocaine should always be administered after a full meal rather than with an empty stomach, as is done with the general anesthetics.

The continued use of cocaine does not cause that "familiarity which breeds contempt," but rather a wholesome respect for and fear of such a dangerous drug. In recapitulation allow me to sound a big note of warning: (1st) Do not become reckless and careless in the use of anesthetics; (2d) do not use any preparation of drugs to produce local or general anesthesia that you are not familiar with; (3d) also do not use any of the coal tar headache cure preparations or sedatives that you are not familiar with, as they are dangerous, dangerous, dangerous!

This article would not be complete without mentioning the subjects of coffee and tobacco. Statistics show that we consume more coffee per capita than any other people, and while we admit the stimulating properties of coffee, we realize the fact that over-stimulation produces sedation, and that brain workers and people who live largely indoors do suffer more or less from this cause, and that dentists who have such careful and delicate work to do should be very abstemious in the use of coffee. And if anyone doubts the truthfulness of this statement, let him abstain from coffee for a period of a month and note the improved condition.

All the foregoing statements regarding the use or abuse of coffee will apply equally well to tobacco. The habitual user of tobacco who lives an indoor life will sooner or later, and usually sooner, notice a more or less impaired condition of the heart's action. The special point is this: If the above is true are we justified in using those things that militate against our general health and impair our usefulness? The public, who employs us to care for them, expect us to be at our best physically and mentally. The same as other drugs, what may be a small dose of caffeine or nicotine to one person, may be a large dose for another one. An old smoker has tersely said, "What a fool I am to smoke several cigars in an evening, and upon retiring feel my heart beating with such difficulty that it interferes with my slumbers; and then in the morning I have that dark brown taste in my mouth, and a dopy feeling nearly all day, that depresses me, and retards the action of both my brain and body." I feel confident that a large part of this audience can corroborate the utterance of the old smoker.

MEMBERSHIP VERSUS NON-MEMBERSHIP OF THE LOCAL SOCIETY.*

BY E. K. BLAIR, D. D. S., WAVERLY.

After a full year's test of the value of the Local Socieety as an adjunct to the State Society, it may not be amiss to look up the record of these local organizations and endeavor if possible to ascertain their relative worth as educational and social factors.

---

*Read before the Illinois State Dental Society, May, 1906.

For many years it has been apparent to the most careful observers that numerous advantages and possibly very few, if any, disadvantages would accrue to the members of our profession if we could all be united in closer bonds of fellowship and brought into nearer relationship in our respective spheres.

The three or four days' meeting of the State Society, while very helpful to all who attend regularly and keep in touch with its workings, has been insufficient to satisfy the wants of those endeavoring to keep abreast of the times in this progressive age.

The dentist living in a rural district has realized how profitable the monthly meeting of the Dental Society has been to the city practitioner who could, with no inconvenience, become a regular attendant. In fact, it has been a source of wonderment that any energetic practitioner living in easy traveling distance after the day's work is complete could forego the pleasure and profit of attending such meetings as are held six or eight months of the year by the Chicago Dental Societies.

With the organization of various district societies made a few years ago when the State was sub-divided into four or five districts, some benefit was derived and a first taste of the advantages made possible by holding district meetings was experienced. Whilst those meetings were very beneficial to all who attended them, they soon proved inadequate to the needs of the hour for two reasons. First, they were not held often enough, and secondly, the place of meeting was too remote for many desiring to attend.

As the number of practitioners increased and the wants of the profession from an educational as well as legal and social standpoint grew, the need for more local societies within easy traveling distance to all who were eligible to membership rapidly became apparent.

Under the wise guidance of your committees appointed from year to year we find ourselves today with thirty odd local societies within the State. All or nearly all in good working order, with a total membership aggregating a large per cent of the licensed practitioners of the State of Illinois.

How this condition has been brought about and to whom the credit should be given for so propitious a beginning of the work of creating a potential organization of our profession in this State, you are as familiar with as any one.

It is the purpose of the author of this paper to present a general résumé of the work of the past year; call your attention to the splendid record of the different local societies; invite you to a renewed and increased effort along the same line, and to present some reasons why those who have withheld their membership should join us in this general movement which has for its chief object the upbuilding of the dental profession.

To the dentist who has never enjoyed society membership and who has only dropped into meetings a few times during his life, much of the matter here presented will seem of little importance; but to the member of our profession who has from year to year felt the many benefits derived from close contact with those who have given their life's work to solving intelligently and scientifically the problems most difficult of proper solution, it is believed the data herein contained will be very interesting.

All progress made is the ultimate result of study and comparison.

Study first that we may determine the origin, progress and remedy for diseased conditions—comparison that we may be justified in our conclusions by the endorsement of worthy confreres, or made to know that others have surpassed us as students and investigators.

Due credit is given to the printing press as a disseminator of knowledge. To those who read persistently a great volume of valuable information is always at hand. Were this the only method by which knowledge could be obtained, meetings of societies would be superfluous. After perusing the current literature of the profession we might, in the best manner possible, considering our ability to grasp the ideas contained in the mass of printed matter, endeavor to put into practice the theories advanced by the contributors to monthly journals and standing publications upon dental topics.

This is practically the position occupied by the non-society attendant dentist. It is one of isolation so far as obtaining information either by contact or technical observation may be considered. He builds about himself a wall of exclusion that shuts out all direct intercourse with the great army of investigators who are foremost in the ranks of professional advancement. If this be the part of wisdom, judged from the standpoint of the exclusionist, possibly he may find himself comfortably situated; but to my mind it not only bars the way to obtaining a vast amount of useful information to himself, but also works a great injustice to his patients.

No matter who the licensed dentist, nor where the community in which he resides, there will gather about him a certain clientele composed of good people who have a right to expect of him a full and complete preparation for the work he is to do.

We can not by any plausible excuse divorce ourselves from the moral responsibility tacitly accepted when we assume the role of guardian of the welfare of our patients. At each successive step from the day we matriculate as students, are graduated by our alma mater, licensed by the State to engage in the practice of dentistry and subsequently enter the sacred precincts of the dental office, where hourly we are called upon to perform the duties of a full fledged practitioner, we are constantly reminded that in justice to our patients and ourselves we are in duty bound to use every endeavor to thoroughly equip ourselves for the work to be done. This moral obligation is so great that pleas of inability to attend society meetings are overbalanced by the indisputable evidence of those who have regularly throughout their lives attended such meetings.

Listen where you may and you will hear but one testimonial from the regular attendant of the dental society.

It is a full and complete note of approval of society membership, one that gains in volume just in proportion to the regularity of attendance and the degree of activity on the part of the participant in society work. Outside of a post graduate course, he finds no such opportunity to familiarize himself with the theories and methods of his fellow practitioners.

To the busy, hard-working dentist a good society meeting with an attractive program is an oasis in the desert of yearly toil—the gateway to a thousand valuable suggestions and ideas helpful to him from a professional and financial standpoint.

Writing approximately, during the last year there has been held in the local or component societies in this State more than one hundred meetings, with a total average of twenty-five or thirty members in attendance. This is a low estimate—so low as to be absolutely safe. Many members have since the meeting of the State Society at Moline last May attended from four to eight meetings. At these meetings, aside from the social features, papers have been read and clinics given. From the first effort of the novice in society work to the finished product of the oldest practitioner taking part in the program, every participant has been benefited in greater or less degree—none so much as those who have entered actively into the work of presenting an interesting program.

As evidence of the unquestionable value of the local or component society, permit me to cite an example. Twenty-five practitioners from three or four counties met at 2 p. m. When they bade each other good night at 12 p. m, without the fatigue that comes from the overcrowding at the larger meetings and with every one present having had an opportunity full and complete to observe and to inquire into every point of interest, these twenty-five dentists had enjoyed the following program:

CLINICS.

Dr. Arthur D. Black, Chicago, Surgical Clinic; Dr. F. B. Noyes, Chicago, Gold Inlay; Dr. C. N. Thompson, Chicago, Seamless Crowns; Mr. Robert Brewster, Porcelain Bridges, with Replaceable Teeth.

PAPERS.

"The Appearance and Conditions of the Beginning of Caries," Illustrated, Dr. F. B. Noyes; "The Scientific Preparation of Cavities for Porcelain Inlays," Illustrated, Dr. C. N. Thompson; "The Local Dental Societies of Illinois," Dr. Arthur D. Black.

How modest and yet how forceful the foot note added to this splendid program by the local committee: "Dear Doctor: We think the inclosed program justifies us in expecting a well attended meeting, and you are cordially invited to join us. There will be a banquet at six o'clock."

Is it possible to measure the true value of attendance at such a meeting as compared to the loss sustained by the practitioner who was conspicuous only by his absence?

It is unnecessary for me to state that the clinics were of the highest order; that papers and lantern exhibits were intensely interesting and instructing; that the social features and fraternal intercourse were helpful beyond a shadow of doubt.

Some will say this was better than the average meeting. If in the general estimate of the year's work we include the Chicago society meetings, the average, I believe, will be even higher than this.

Whilst preparing this paper, official replies to letters of inquiry have been received from almost every local or component society in the State. The promptness exhibited, the manifest effort on the part of these correspondents to aid in gathering statistics of the year's work, is to me one of the most hopeful signs when we contemplate the future of this Society. Personally and for your program committee, permit me to thank the different secretaries for their courteous treatment and for the information so cheerfully given.

It is proof positive that we are working harmoniously, that we have passed from the position of isolated practitioners circumscribed by the narrow limits of our own offices into the broader field of concerted action.

Time will not permit the reading of so many letters nor the presentation, seriatum, of all the reports rendered, but I can not forego the pleasure of reading to you one of the numerous letters from the secretary of a component society. This society held its meetings as follows:

	Papers.	Clinics.	No. Present.	Banquet.
April 8, 1905	..	..	10	1
September 9, 1905	1	1	9	..
October 14, 1905	2	..	9	..
November 11, 1905	1	..	9	..
December 9, 1905	..	1	8	..
January 13, 1906	2	..	9	1
February 10, 1906	..	..	5	..
*March 12, 1906	2	2	10	1
April 7, 1906	..	..	10 estimated	

* Visitors, 13

This report is selected as one showing the results to be obtained when the program for the meetings throughout the year comprises papers, clinics and social features, three banquets having been enjoyed by the members of this local organization.

That much benefit will be derived from closer contact in a social way with one another, the record of this society clearly shows. The subjoined letter of the secretary of this society will demonstrate what practical results are within the reach of any body of earnest workers where all have the good of the profession at heart:

April 3, 1906.

Dr. E. K. Blair, Waverly, Ill.:

Dear Sir and Friend—Dr. ——— has forwarded your request for data to me, as the proper papers had not yet been turned over to him. Have completed it as accurately as possible and trust it will meet your requirements. Am pleased to report our local organization in good condition and the best of good feeling exists among the members, all working together without perceptible friction.

Am pleased to add that with our assistance the ——— men have finally gotten down to business and are now united and harmonious, and have adopted a fee bill based on the one we use and are getting better fees than for many years and consequently doing better work.

The reorganization has proven a great blessing to this section of the State. Formerly ——— and I were the only ones to attend the dental meetings, but last year we had not less than eight from this county.

With best wishes,

———————

I commend this letter to you, written as it was by one of the most faithful and conscientious dentists in the State of Illinois, for your earnest consideration.

The records of the meeting with twenty-three members present, an excellent program and splendid social hour enjoyed by all, and the year's record of the second society, one of the smallest in the State, that has accomplished so much good, even to lending a helping hand to worthy neighbors, are sufficient to show the great benefit derived by active members and the loss sustained by fellow practitioners who absent themselves from such meetings. Is it possible to enter a stronger plea for membership in the local society?

It is in these organizations that the first work of every new recruit should be seen or heard. One properly admitted to the component society, which is the vestibule to the State Society, the road to advancement is made easy—profitable from an educational standpoint and pleasant to all who possess the proper appreciation of the duties and responsibilities confronting us as loyal members of our chosen profession.

Not the least of all benefits derived by those who meet frequently are the social enjoyments. The oftener we meet, the better will we comprehend each other's motives.

As a means to a very useful end, the "Bulletin" has served a splendid purpose. Its monthly visits are welcome and it might be improved by publishing many interesting items that would make us better acquainted. It is a constant reminder of what others are doing and as such spurs us to action. To the young men, especially, let me say that many a year's hard work will be made easier, many a trying hour shortened, many a difficult task simplified, by entering actively and earnestly into your society work.

The limitations of time properly put upon a paper like this forbid the reading of many letters from other secretaries equally forceful. During the last sixty days much time has been given to a careful study of the status of society work in this great State, and I beg of you to believe me when I say to you that the past year's work has been full of desirable results and that the vantage ground so far gained ought not to be lost.

Born of the purest motives and inspired by a commendable desire for self-improvement, the work of reorganization was begun. The splendid record of the initial year invites us to a renewed effort. As yet we are in the formative stage. The future work of the local society is two fold. Self-improvement, always a duty, is paramount. In addition to this we owe it to our chosen profession to bring within our fold neighbors who by every right ought to be brothers and coworkers.

The labor incident to the never-ending study necessary to all who march in the vanguard of progress will be lightened by the pleasure of welcoming to our midst all eligible to membership. Mutual benefits will be derived. In return for the advantages offered the new recruit by these progressive organizations, we will profit by the infusion of desirable new and vigorous blood.

The outlook for the new year is full of promise. Let us consecrate ourselves to the work and hope for splendid results.

PROCEEDINGS OF SOCITIES.

CHICAGO-ODONTOGRAPHIC SOCIETY.

A regular meeting was held March 20, 1906, with the president, Dr. W. H. Taggart, in the chair.

Dr. J. R. Callahan, of Cincinnati, Ohio, read a paper entitled, "Herbst Burnisher and Gold Fillings," which was illustrated with stereopticon slides.

DISCUSSION.

Dr. D. M. Gallie:

It has been a pleasure to hear this paper dealing with a subject that is old yet new to most of us who are followers of the methods of filling teeth with cohesive gold and pluggers. I congratuate the doctor on his courage in coming to this town of mosaic workers and inlay setters, telling us how teeth can be saved with gold foil and tin. I know something of the doctor's ability and we all know that he has been doing this for many years. I am not familiar with the Herbst method of filling teeth, and while I have used non-cohesive gold to a considerable extent, I have not used it in the manner suggested by Dr. Callahan, hence do not feel that I am competent to discuss this paper.

I thought that Dr. Callahan would say something about the density of these fillings he inserts in this way, but I suppose that adaptation of the filling to the walls of the cavity is of more importance than density. A filling may not be very dense, but if it has been adapted properly to the walls of a cavity it will save the tooth. Therefore, so long as he gets perfect adaptation, and that is all he claims for his method, he gets good results from his work. I wondered whether it was possible in the use of this method to go further than he went, not confining it to occlusal and buccal cavities. I imagine it could be used to good advantage in the gingival third of proximal cavities in bicuspids and molars.

He spoke of the advantage of using this method for filling children's teeth. All who use tin know that it is splendid in these cases. He also spoke of its use in submarine work. That is new to many, because submarine work has not been taught in late years. We are told not to depend on fillings put in under moisture, and I am inclined to believe that if teeth are so badly broken down that it is impossible to adjust the rubber dam, it is better to resort to inlay work where there are large restorations and depend on the retention of the inlays by cavity preparation and cement to hold it. Many men may not follow the doctor's advice in using this material for submarine work because I am sure that the great majority are skeptical of submarine fillings. I am sure it does all he claims for it, because he has a pair of hands that can do almost anything with filling material, and consequently what is a success in his hands might prove a failure in the hands of many of us. And so I would warn some of the younger men to go slowly. They attend a clinic and see a method demonstrated that looks easy and they try it in every case. They have failures and blame the man who advocated the method.

I also question the benefit and the virtue of this method of burnishing the matrix for inlay purposes. I have noticed that whenever the burnisher, whether hand or rotary, comes in contact with the matrix that it has a tendency to harden and make it spring away from the margin. Dr. Callahan's suggestion is a good one; that we get better results if gold is covered before burnishing with a strip of tin or rubber.

I am sure we were all interested in the slides shown and in that part of the paper having reference to the use of burnishers in the introduction of amalgams as a filling for these large cavities. A few years ago a member of this society read a paper on amalgam fillings, claiming that if the first piece of amalgam introduced into the cavity is thoroughly burnished it can be forced into the dental tubuli. He advocated the use of the hand burnisher. Many scoffed at that paper because they thought it was getting things down pretty fine; but, perhaps, he was not so far wrong after all. I have found that I can get better results by burnishing with the hand burnisher, the round ended amalgam burnisher, than I do trying to put the material into place by direct pressure. I may be wrong, but in the last few years I have never attempted to restore a complex cavity without bringing it down to a simple cavity with the use of a matrix. We have many now that can be adapted to every kind of a case where there is a proximal restoration, and by introducing the amalgam in a small piece and thoroughly burnishing, carrying the excess of mercury out to the margins, I feel that I am getting a better amalgation of the material than by simply carrying it in with direct force or hand pressure. I think Dr. Callahan's slides and his advocacy of the burnisher in this connection will stand the closest scrutiny and investigation.

His suggestion to use cement in the bottom of the cavity is a good one. It has been advocated by many. Cement protects the pulp and helps to retain the filling. Of course, I do not believe in attempting to put any kind of a filling into teeth; no matter whether gold, alloy or inlay, I do not believe in depending entirely on cement to retain the filling. We must have retention and resistance form to cavity, and if backed up by cement, protecting the pulp and aiding in retaining the filling, I am sure we will get a combination that will be of excellent service.

DR. EDMUND NOYES:

The society is to be congratulated upon hearing a paper which represents so much work and experimentation and so much experience in the practice of dentistry. I am sorry to admit that I have left experiments in new things to other men, who have an aptitude for such work, and for that reason such things as the Herbst method are entirely out of my experience. Things that have passed the experimental stage I try to get hold of, and I gladly appropriate, as we all do, the work that other people do for us. Therefore, anything that I may say will be mostly theoretical and without any pretense of authority.

It was suggested in the paper that the burnishing of pure gold will not fit it tightly against the enamel margins. That is to say, the act of burnishing will not make a tight joint with pure gold against a wall or margin. It hardly seems possible that so small a proportion as one-tenth of tin would overcome this propensity of gold to spring and fail of perfect adaptation, especially inasmuch as the very thin sheet of tin is enclosed between two comparatively heavy layers of gold and the gold must of necessity receive the strongest and principal impact of the burnisher. Without having made a trial it would seem to me impractical that a tight joint could be made of such material when it could not be made of the Abbey foil. However, this propensity of the gold would imply that in the handling of it for all our purposes, whether for filling or for the making of a matrix, the less we can rely on the rubbing and friction of a burnisher and the more we can rely on a direct pressure such as we get in swedging, the better adaptation we might expect to obtain, and I have a suspicion that if a matrix is adapted to the form of a cavity pretty accurately and then is thoroughly annealed that the better final adaptation is likely to be under the heavy pressure of a swedging press than by rubbing it with a burnisher which would tend to thin and stretch it and destroy its contact and adaptation, especially at the margin.

The same thing, I suspect, applies in the manipulation of amalgam. Dr. Black told us many years ago that amalgam can not be adapted perfectly to the margin of a cavity by the rubbing action of a burnisher, but that it can be adapted by strong direct pressure, forcing it down to where we want it, implying that when we have done that the surplus must be scraped or cut away rather than rubbed away, and that the material which has been forced straight to its place by a direct force or pressure must be allowed to lie there until it is hard enough to be trimmed with safety. It would seem that the rotary burnisher would have the tendency to work out and diminish the size of these little air bubbles which the essayist referred to in his paper. I noticed that in speaking of the handling of this rotary burnisher in the packing against the walls and margins, he advocates heavy pressure in connection with the rotary motion. I wonder how much of the close adaptation and effective packing is done by the pressure as distinguished from the burnishing.

I wish that I had experience by practice or experiments that would enable me to discuss this paper as it should be discussed.

Dr. G. W. Dittmar:

I am very grateful to Dr. Callahan for coming to Chicago and giving us this very valuable paper. I do not believe, however, that he intended to convey the idea that this is the Herbst method of filling, because it is not. Dr. Callahan merely uses some of the Herbst instruments in the final condensation and polishing of the filling. While in Paris in 1900 I saw many teeth filled by this method but it did not appeal to me. The fillings seemed to be so inferior to the fillings I had seen put in by Chicago dentists that I did not pay much attention. The Herbst method was to place Wolrab's noncohesive gold into the cavity first. He claimed that this gold was very pliable and soft but noncohesive when first placed into the cavity. Then he would use his rotary burnishers, steel as well as agate and blood-stone points, and thoroughly burnish the material into the cavity. This caused the noncohesive gold to become cohesive. Then he placed another layer of gold and burnished again, repeating the operation until the filling was completed.

A number of our best men in operative dentistry have classified the qualities necessary for a good filling material in the following order: First, indestructibility in the fluids of the mouth; second, adaptability to the walls of the cavity and the cavity margin; third, freedom from shrinkage or expansion; fourth, resistance to the stress of mastication; fifth, color of the material used; sixth, non-conductivity of thermal changes; seventh, the convenience of manipulation. The material Dr. Callahan used in his clinic this afternoon was tin and gold. There is no question that this material is highly adaptable. It is indestructible in the fluids of the mouth. It has pretty good color, is a fair non-conductor and it is fairly convenient in manipulation. There is one thing to which I would take exception, however, and that is that it will not resist stress very well when placed in occlusal cavities. While testing a filling this afternoon I was surprised to note how easily I could sink an instrument into it. That convinced me that unless it was condensed harder that he condensed it it would not be a good material so far as resistance to stress is concerned.

Dr. George Dennis and the late Dr. J. J. R. Patrick, I believe, have been given credit for inventing two instruments, the knathodynamometer, for measuring the strength of the jaws, and the phagodynamometer, for measuring the force needed to crush foods. The stress needed to crush an ordinary tough beefsteak is 40 to 80 pounds; to crush an ordinary crust of bread is 80 to 100 pounds, and unless some lateral motion is used the bread will pack between the teeth instead of crush. The force needed in the mastication of food is great, and it seemms to me that a combination of tin and gold would not resist stress and that it will wear out gradually, although there is no question that the adaptability is such that the margins will keep close.

Regarding the use of the Herbst burnishers for inlay work, I have used them some, not the smooth ones, but those that look somewhat like ordinary excavating burs. With the aid of these burnishers you can get a matrix properly adapted to the walls and margins of a cavity, but I differ with Dr. Callahan in that getting the instrument in contact with the metal will do any harm. I do not hesitate to put the burnisher in contact with the metal all over the margins. I anneal and reanneal a number of times and after the final annealing I am careful not to burnish again, but rather swedge it to place with unvulcanized rubber.

Regarding amalgam, we have been taught not to burnish but to pack, using as much force as we can. Have four walls to the cavity; have the amalgam in proper condition; do not let it get dry and hard;

use proper shaped instruments and thoroughly pack with direct force. The combination of amalgam and cement as outlined by the essayist I have used considerably, but mostly in deciduous teeth or in teeth where I could not get proper retention.

Dr. G. V. Black:

Dr. Callahan has been doing a good deal of experimental work and I wish to thank him for what he has done and for the opportunity of hearing his excellent paper. There are several points of great importance in the paper. I do not know so much about the Herbst method of packing the amalgam; but some years ago I wrote about the use of burnishers for this kind of work, but the burnishers were of the kind used by hand with a back and forth motion. You all remember the old trick of burnishing amalgam onto a toothbrush handle. I have done that many times, snapping it off after the amalgam got hard, but I never saw one with a perfect surface. They were all full of blisters and air bubbles. In fact, I never saw an amalgam filling made with a hand burnisher that did not present this condition. And I have said, never use a burnisher.

The rotary burnisher is something different, and I do not remember that I have tried that and examined the results of the work. The result may be different from that obtained with the old burnishers. I was not surprised that Dr. Callahan found these little openings. I am surprised that he did not show more of them. And let me tell you that he might have shown just as many in some of our gold fillings that we are so proud of. I have seen gold fillings that were as bad and worse than the pictures he showed. I wish to compliment the doctor particularly on these illustrations. They are excellent. They look like the thing itself. I may surprise some of you when I say that most of your amalgam fillings are from 12 to 16 per cent air. The same is true of your gold fillings, but with amalgam it is almost impossible to get the air out.

We can show this best, perhaps, by the specific gravity test, taking the specific gravity of the mercury, of the alloy used, and of the product. I have some unpublished notes of some experiments I conducted some time ago. I took a large mass of amalgam, kneading it with the mortar and pestle until the filings were all engaged. Then I worked it in the hand and divided the mass into halves, working one part until a good ball was formed, compressing it with the hand as hard as I could. Then I laid it aside. The other part was kneaded very hard and long for the purpose of removing as much air as possible. It was then compressed in the hand and laid aside. The specific gravity test showed that the first mass contained 16.83 per cent air; the second contained 14.94 per cent. I once tried to work the air out by washing the amalgam and floating out the air. I squeezed and scraped the mass trying to get out the fluid, but I found that it had taken the place of some of the air and it was impossible to get it out. Filling with amalgam that has been washed is filling a wet cavity. Dr. Witzel in his great work on amalgam says that washed amalgam never made a tight filling. They all leak. So that I do not know of any means to get this air out of the amalgam, and we will always have these little holes or cells, as Dr. Callahan calls them. The best method of making amalgam fillings tight is to use all the force we can and pack it along the walls with a very small instrument. The amalgam must be hard enough. It is not so difficult to make walls that are practically perfect. It is easy to make walls that will not show spaces with the naked eye, but it is not so easy to make walls that will not show spaces with the microscope. We can do that with gold more easily than we can with amalgam, and if we could work amalgam as well to the walls of our cavities as we can gold, it would stand as well. But we can not do that until we have a different amalgam than that we are now using. Still we can make fillings that will do our patients much good, often where a gold filling would not answer as well.

I am very glad that Dr. Callahan has brought this matter up. Of course, the other fault is one in manipulation. That can be remedied by careful work. I first learned to fill teeth with noncohesive gold, before we had any other. If the gold is laid properly, so that the wear comes on the margin of the sheet as it is laid in the cavity, fillings can be made in occlusal cavities that will wear well. Some of the older operators, especially the late Dr. Morgan, of Nashville, used to put in a large number of gold wedges, made by cutting down gold wire, driving them in between the layers of gold, and they made very strong fillings. But all these methods have gone from us as a profession. We can not buy the necessary instruments to do this work, and we can not afford to make them.

I should never make anything submarine, unless it is intended for temporary use. No doubt some submarine fillings have stood. Some of the poorest things I ever saw stood, and they will continue to do so. Yet the cavity would, perhaps, have been better off if nothing had been done to it. The filling of a cavity has sometimes been the destruction of the tooth.

As to tin and gold, I never could see any reason for using the combination when soft gold is so readily adapted to the walls of cavities. A good filling can be made of tin and gold, but why make one when the other can be used so easily? There is not much difference between the two in manipulation.

Dr. Jackson, Milwaukee:

I bring you greetings from Milwaukee. I consider myself fortunate to be with you, and I have listened to Dr. Callahan's paper with a great deal of interest and pleasure. With regard to the crevices and air bubbles in the amalgam, I have in mind a point that has not been brought out here this evening, and that is the mixing of the amalgam. It is my conviction that the mixing of amalgam in the hand is unscientific and unclean. I can not see how any one can expect to get good results from such a procedure, incorporating sebacious matter and bits of cuticle into a filling for a tooth.

Take a knife blade, scrape the palm of the hand with it and you can see what goes into your filling. And you will not have need of a microscope to see it either. Try mixing your amalgam with a stiff steel spatula on glazed paper. Begin as usual with the mortar mix, then transfer to the paper and with the spatula triturate it thoroughly by placing the spatula on the mass and drawing it toward you. You can in this way make a homogeneous mass. Mix in this manner three or four times using a clean place on the paper each time, and it will also clean the amalgam.

A little experience and you will note a difference in the feel of the amalgam under the spatula, and a change in the appearance also. I believe with this method you will get an amalgam that will work more smoothly, and possibly it will eliminate these air vesicles and crevices as so beautifully shown us here tonight by Dr. Callahan. I have been unable to get a suitable instrument of the dealers. Take an old instrument, heat it and flatten the end into a short broad blade. It should not bend at all under the pressure. Polish it well and keep it polished.

The other points in the paper have been thoroughly discussed by the more able men who have gone before me, and I will not take the time of the Society to mention them. I could add nothing. I want to thank this Society for the privilege of being here, and I am very grateful to Dr. Bentley for the invitation.

Dr. J. E. Nyman:

Neither Dr. Callahan nor any other gentleman present who fills teeth with inlays would say that inlays should be placed in the class of cavities for which Dr. Callahan advises the use of tin and gold. We would not think of filling an occlusal cavity with an inlay but would fill it with tin and gold. Dr. Callahan's tin and gold fillings can be inserted with the same ease and certainty as noncohesive gold fillings, and they possess properties that make them more valuable preservers of teeth.

I think amalgam may be said to be on the suspect list of filling materials because the personal equation seems to enter more into the making of an amalgam filling than any other filling material. It has poor edge strength. It is brittle. It is an unsatisfactory filling material in those teeth in which there is much overbite; where there are long cusps and deep sulci. The edges give way rapidly under the stress of mastication.

Many of you may have your doubts as to the value of the suggestions contained in the paper, but if you will investigate and throw aside your theories, you will agree with Dr. Callahan. He practices what he preaches, and his results have been very satisfactory.

Dr. T. W. Brophy:

I appreciate the work done by Dr. Callahan. I am satisfied that his results have been all that he anticipated when he began this work. We are often astonished to find that the unexpected happens when least we expect it, and many times we learn things on investigation that were never dreamt of before; even simple things that are, however, fundamental. It took me fifteen years of close application in cleft palate operations before I learned that the upper jaw is as much wider than the lower as the difference or space between the edges of the fissure. And yet it was before me all the time.

Amalgam will always be used as a filling material, and it has unquestionably been of value. It has saved many teeth that otherwise would have been lost. Yet it generally fails sooner or later.

While Dr. Callahan was reading his paper in describing the merits of gold and tin—and that, in my judgment is the best way to treat these borders—I recalled the work of Dr. J. Robinson, of Jackson, Mich. He invented what he called Robinson's filling material. It was mostly tin. That material was used a great deal about cervical borders. I have some patients whose teeth I filled with that material fifteen years ago and their teeth have been preserved perfectly. We did not know much then, when this filling was employed, about the modern and more perfect way of preparing cavities to prevent the recurrence of decay along the proximal surface, and yet, even with the modern cavity preparation, I believe that the tin and gold, as suggested by Dr. Callahan, using a smaller percentage of tin than we employed formerly, placed into the cavity and condensed is better than the old method of half and half; but we accomplished with it what Dr. Callahan told us he accomplishes with the rotary burnisher. It enabled us to get a tighter adaptation of the material to the walls of the cavity and thus more perfectly seal the cavity and prevent leakage, and I have no doubt that that is the explanation of the success of the combination of the metals at the cervical borders where fillings so frequently fail.

It would not be amiss today if the teachers in the schools of dentistry would use tin and gold more generally in these places, and I know that it would do the student, the patient and the profession a greater service if the students were better trained in the manipulation of tin. When I was a boy the dentist filled some of my teeth with tin and it remained in there for about fourteen years; but it seemed to wear out at the borders. Perhaps if he had filled these teeth with gold, as they did then, I would have lost the teeth. So the lesson we have learned here this evening from Dr. Callahan's paper will be of lasting benefit to the young men and to their patients. The Society must appreciate what he has done and also what the program committee has done in bringing before us such men as Dr. Callahan who give us something that is of service to us in our work. Everybody who has attended this meeting has been benefited.

Dr. E. J. Perry:

The paper has done me a vast amount of good because the doctor has talked about filling teeth with foil. That is something we need. I can not say much about the Herbst method. I got some of the burnishers; tried them, and discarded them. I could not burnish gold into a cavity with as much satisfaction as I could mallet it.

I was taught to use tin foil, and I use it considerably, although not as much as I should. I am in the habit of using amalgam where I should use tin foil. I have used tin and gold with very satisfactory results. I think we can make some very serious mistakes and poor fillings by using cement with amalgam, because the cement will go out of the cavity first, before the amalgam, and only a skimming of cement remains under the amalgam, and if the matrix is placed first, then put in the cement and fill with amalgam, you will find that there is a very thick heavy lining of cement at the surface of the filling; whereas, if you put the cement in first, before the matrix is put in position, and then burnish in the amalgam, wipe off clean all margins before putting on matrix and then force amalgam in, using a piece of bibulous paper in front of the instruments, and you can drive it in slowly, stopping to scrape off the surplus amalgam. You can put in a good amalgam filling in that way.

There is a gentleman in the State who uses cement in connection with gold, and a very good filling can be made in that way, and also a very poor one, if you are not careful. It is possible to force the cement out and have it so thick around the margins of the cavity that while it is hermetically sealed, yet the cement will wash out in time.

Dr. J. G. Reid:

I have known Dr. Callahan for many years. I have visited him in his office. He has given me clinics in his office on the use of tin and gold. About twenty-three years ago I read a paper before the Chicago Dental Society on the use of tin and gold. I began to use tin and gold for filling material about that time, and I have pinned my faith to that material as an agent for the preservation of tooth structure ever since. I have never been dissatisfied with it and I expect that I have put in more tin and gold fillings than any one else in Chicago. My knowledge of the use of it I obtained from Dr. Callahan and to him I owe thanks.

Five years ago he appeared before the Illinois State Dental Society and gave clinics which aroused much attention and enthusiasm. He is an expert in this work and knows whereof he speaks. He has not told you anything that is not true and that he has not done himself. I have had patients come to me whose teeth Dr. Callahan filled with tin and gold ten years before, and those teeth were still doing good service. Some of the fillings were on the occlusal surface of molars. It is a great pleasure for me to have an opportunity to thank Dr. Callahan in public for the little I know about tin and gold as a filling material.

Dr. Callahan (closing the discussion):

As regards the density of tin and gold. We find cells in all fillings, except these, as can be seen in specimens that I have with me.

As to the wearing out of the filling on the grinding surface of molars where from one-half to two-thirds of the surface is exposed to wear and stress. The ten parts of gold to one of tin will stand that wear.

What Dr. Dittmar said of the fillings being permeable to instruments is true, but that is the salvation of the filling. Being soft it spreads perfectly to the cavity, then after having been in use there comes a molecular change in the mass; and after a time, it will take a sharp bur to make an impression on the filling. This is a condition so generally recognized in tin-gold fillings that it was not mentioned in the paper.

Dr. Black asks—why use tin-gold as a filling at all. A very pertinent question, and one that is answered vaguely, 'tis true—in the paper—the cohesive gold foil filling is conceded to be the standard, but in the cavities mentioned tin and gold, as described, will last as well and can be put in in one-third of the time that a cohesive foil filling can be introduced, thereby increasing the earning capacity of the dentist 33 per cent at least, for I claim the fee should be the same for one as the other.

I know it throws the average dentist into a fit—to try to convince him that he should get out of the day labor class, but let us hope that the day may come when the dentist will be able, not only to make the dental supply people rich, but have a little left for himself.

As a rule, I do not approve of submarine fillings, but when they are necessary, tin and gold is the best material for filling such teeth. I do not mean a cavity that is full of saliva, but it is impossible to keep children from putting the tongue into a cavity during its preparation, thus moistening it. Before any one attempts to do this work, it is advisable to practice on extracted teeth to get the experience.

In regard to the burnishing of amalgam I have noticed the difference between the hand burnisher and the rotary burnisher mentioned by Dr. Black. In order to get good results, the burnisher should be run quite slowly and always as near as possible toward the margin of the cavity. After you have the matrix on the tooth, take the hand burnisher and try to force amalgam between tooth and matrix. It does not go very far, but with the rotary burnisher you can force it clear around the side of the tooth in a very thin layer like putty.

ILLINOIS STATE DENTAL SOCIETY, SPRINGFIELD, MAY 8, 9, 10, 11, 1906.

DISCUSSION OF DR. CROUSE'S PAPER, "REMINISCENCES OF FORTY ODD YEARS OF PRACTICE."

Dr. G. V. Black:

I received Dr. Crouse's paper about noontime on Monday, when I was feverishly busy trying to arrange things to be away for the week, but I at once sat down with my stenographer to dictate something to say, as the only way to get at the matter in the limited time I had.

Dr. Crouse's paper has perhaps interested the older more than the younger men. The young man is looking forward more than backward, and it is the older men who are more inclined to look backward over the past. I am often sorry for this, because the young man would learn much by going over the past of dentistry. I can appreciate all he has said in regard to the office student, and perhaps more, for I grew up in the wild, woolly West, away out on the frontier, and as a boy I thought much more of what I could see and learn in the woods and in the great prairies, where there were wolves, wild cats, big snakes, deer, turkeys, prairie chickens, etc., and a full range of the smaller animal and bird folk. To the east was unbroken prairie as far as the eye could reach; to the west, the forest, and I thought much more of these than of the farm. I grew up a long, slender youth, with very poor health, and my parents thought I would make a better doctor than farmer. So I was to study medicine, but I switched off after two years into dentistry. I entered an office, as Dr. Crouse has said, but with no thought of going to a dental school, for I had only the vaguest notions of what a dental school was like. Neither did any of those with whom I had at that time consulted, but I did learn very early that a position in an office was often unfit for a student unless he had within himself that which would impell him to study, for the practitioner was more likely to be a poor tutor than a good one. I was not unfortunate, however, for I found some books, and these I read, not once, not twice, but over and over again, until I almost knew them by heart, and then I soon found that there were things coming before me even in my observations of that practice that were not described in the books. To my mind it isn't so much the opportunity a student may have as the use he makes of that opportunity, and you will find this makes *men* as well as good students.

A little later I became acquainted with the dental schools as they then existed, and I can appreciate fully that our schools of today are but little like those early efforts at teaching dentistry. I also appreciate keenly the fact that our schools must advance far more with the future. The teaching is not yet sufficient, though it is certainly far better than it was in the years of which he speaks. I remember well the introduction of the dental engines and of the work we did with hand instruments before they were brought to us. I also have some curious memories of the opinions of dentists of the machine drill, as some of them termed it. "No, no! The idea of putting a machine in a man's mouth. Why, my patients would never stand that in the world," is one of the expressions that I remember very distinctly. Yet, nowadays, who could operate without the machine? And in other ways our instruments have been improved as much, until nowadays we are very much better equipped with hand instruments, even, than we were in the days of old.

I remember some very curious experiences also with the introduction of the rubber-dam, and the difficulties we had in those days in using the rubber-dam, for I practiced for a good while before Dr. Barnum thought of the rubber-dam. It was no easy task to learn to use the rubber-dam in those days when nobody knew how, not even Dr. Barnum. We had none of the accessories—that is, instruments that help us to put the rubber-dam on and to hold it on after it is placed over the teeth. The result was that at the first many of us felt that where we could use the rubber-dam we did not need it, for most of us had learned to keep cavities dry pretty well with small napkins, cotton rolls and such as that. And I remember full well an expression from Dr. McKellops, one of the most skillful manipulators of the world. After he had visited Dr. Barnum, staying with him two weeks, watching him put on the dam, he came home and tried it himself. Six months later he stood up before a dental society where the rubber dam was under discussion and described his efforts and his failures, and said that he had tried the damned dam, damned the damned dam, and threw the damned dam away. But he used the dam afterward, nevertheless.

I remember, too, that during the same discussion I was trying to tell how I tied a ligature to hold the rubber-dam on the tooth, when Dr. Forbes looked up and seriously said, "Doctor, does it ever slip?" I said, "Oh, no; if you tie it, so and so, it won't slip." The Doctor replied, "Oh, I wish it had slipped just once." The joke was on me, for every one seemed to take him to mean that if it had sometimes slipped I might have been believed.

It is interesting to recall the Arthur method and how many of us tried this rather too persistently, and used it in too many places, to the injury of our patients. But it was no worse than the wide separations made with the ordinary separating file before that time. We are glad it is gone and is buried in those old books and journals of the past. I have still a copy of Dr. Arthur's book on the Arthur method of separating teeth; as a relic it is interesting.

I never had much use for the mechanical mallets. The mallet in the hands of a well trained woman is the best mallet to my mind, though I tried the mechanical mallet the same as the rest of the boys. I also used the heavy gold, but was fortunate enough to make but a limited use of it, about enough to learn how right well, and then I gave it up because I found I could make better fillings and make them easier with the foils of more moderate thickness. Then came the crystal gold craze, that the Doctor has not mentioned, very soon after the introduction of cohesive gold, and that has bobbed up severely, time after time, ever since, but it has never displaced foil with any considerable number of dentists for many years at a time. That is perhaps enough to say of it. The extremes in the use of cohesive gold were as great or greater than the Doctor has made them out to be, and even today there are many men practicing who use only cohesive gold, never having learned to combine it with the non-cohesive. I should almost feel as though I had lost my best friend if I couldn't combine non-cohesive with the cohesive gold in certain parts of my cavities in filling teeth, but we do not want extravagance in the use of it.

Dr. Crouse has spoken of the reputations that were made by building out great fillings with cohesive gold, restoring large portions of lost tooth structure and of the hours of labor that these men put on such work. It was in this that Dr. Webb made his name known the world over. There is no doubt but that these buildings were excessively extensive. I remember I obtained more than half of a bicuspid tooth that was built in gold by Dr. McKellops, of St. Louis. When I took the specific gravity of this block of gold I found it very nearly equal in its density to cast gold, and how the root of that bicuspid had stood the hammering that was required to condense that block of gold has always been a mystery to me, for it was not only a very solid piece of gold, but it was hammered gold, hard as we would make it under the hammer on the anvil. That was before crown work began, but the crown work has come to stay. It is a good thing to do when it is done well, and when badly done it is often very bad. These younger men, many of them, suppose that it has always been with us. So it has, further back than my memory, in some of its forms, the old pivot tooth crown with a hole in it. Bore out the pulp canal of the incisor root to match, then make a pin of stout hickory wood, drive it tightly into the tooth and in turn tightly into the root of the tooth, joining the two. That was the first crowning of teeth that I did, and some of those did wonderfully well. We had no cements, and the better joints we could make between the two, the longer they would stand, but it was only a question of time when they would go to pieces, roots and all. When we look back over the new departure where the watch-word was, "When teeth need saving badly, gold is the worst material to use" (plastics), it seems funny, though it was not funny those days, for very many men did, under the influence of this teaching, that which they would not now care to repeat, for they find that it was not good for their patients.

The rubber question in the days of litigation was something that I hope the profession may never see again. It did not hurt me, personally, so very much. I paid a couple of hundred dollars to be let off and insisted that they should put a permanent injunction on me and collect whatever the law might give them if I violated it, and used celluloid instead. I made a good many of those plates over very soon after the life of the patent had elapsed, but if we had had a Dr. Crouse to manage the matter for the dentists at that time, things would have been different. The rubber question was much more discussed in those early days than it has been since, and I must say that I never had any sympathy with the general tirade against the use of the rubber plate, but what Dr. Crouse has told you of the wholesale extraction of teeth, and especially for young girls, as he has said, was a shame on dentistry. I remember one case of a woman who had had her teeth extracted in this way when she was a young girl, all of them. She came to me when her children were grown, and asked me if I would make her a new set of plates. When I came to examine her mouth I found the lower jaw bone almost gone from shrinkage. I took my instrument (the double end caliper), that I used for measuring the thickness of rubber plates in finishing, placed one of the prongs on the alveolar ridge in the mouth and the other on the skin under the jaw, and pressed them together slightly, and I found only a quarter of an inch between the other two points. The lower jaw had shrunk so much that I was almost afraid to handle it in taking an impression for fear I would break it. This may be an extreme case, but the shrinkage that occurs oftentimes after this early extraction of the teeth and during the wearing of the plates is something fearful in the loss of bone as well as in the softening ridges, of which the Doctor has spoken. We do not hear or see so much of these softening ridges nowadays. People have learned to keep their plates cleaner and in better shape, for it was the failure to keep the plates clean, even reasonably clean, that caused most of this soft tissue.

I appreciate and agree with what the Doctor has said of porcelain inlays, though we can not give up porcelain inlays. But we will learn to use them in their proper place after a while, and they will do us much good. Are we through with extremes? Not by any means. Dentists are very much like school boys. Man is born, he grows up to manhood, he becomes old and dies, but the school boy is the same always. So is the young practitioner. It is to be hoped that as the young practitioner begins his work with a better education, that we will have less of the injuries that come from running after fads. But we can not blame the boys too much, for not infrequently they develop useful things in chasing the will-o'-the-wisp, but it should be the effort of all men in dentistry to prevent injury to our patients by the following of these fads, or if they can not prevent injury, to reduce it to the smallest amount of injury possible.

Along this point, I am fearful of this craze now running over the country on the use of Somnoform. I have tried the anesthetics of which this is a mixture and laid them aside, as did most men who tried them when they were first presented to the medical profession.

They never came into general use and I doubt if they ever will in any form. I should say to all those who are using them, "Have a care; you may get into trouble."

I am not old enough to have personal observation of the earliest dental societies, but I saw nearly the first of them in the West. I was a charter member of the Missouri Dental Society a year or two before the organization of this Society. Before this my affiliations and my trading point was with St. Louis. Very soon, however, this was transfered to the Illinois Society, attending both regularly for a number of years. The dental associations are at once the strongest developers of dentistry, of good fellowship among dentists, and of dentists individually.

I thank you for this opportunity to say something on this subject.

Dr. C. B. Rohland, Alton:

These "reminiscences" are very interesting to me. They will be especially interesting to the older men, because by reason of their intimate personal knowledge of conditions then and now, they are necessarily so much better able to appreciate the significance of the changes that have taken place in thought and practice, than those whose experience dates back only a few years.

My own advent into dentistry was almost coeval with the beginning of the general, but still reluctant adoption of rubber in the better class of offices, but antedated those other epoch making appliances, the dental engine and the rubber dam.

As the essayist truly intimates, the younger generation can hardly conceive what dental practice without our present mechanical conveniences must have meant in those days, not only to the operator but the patient as well. Take the one problem alone of controlling moisture, when the sole reliance was on napkins, towels, duct compressors, and worst of all from the standpoint of the patient, those infernal tongue depressors. As a patient I was unfortunately an abnormally "juicy" one, just the kind the dentist would most willingly turn over to his most deadly enemy. The operator, if he realized in time what he was up against, always gave me the benefit of all he had "in the box," so that, by the time I was duly stuffed and clamped and gagged and trussed, and then punched and hammered for hours and hours, my utter discomfort and distress can better be imagined than described. After such an operation, which in a busy practice was quite a usual thing, the patient, to say nothing of the operator, felt more or less like a nervous wreck. I shall never forget these experiences, although nearly forty years have elapsed since then. The only ray of sunshine to me at such times was, as the water mains were turned on full head and as the tide kept rising higher and higher, to watch with fiendish glee the look of apprehension and anxiety gradually stealing over the face of the operator, and speculate as to what he was saying to himself "inside," as he tried with frantic haste to finish before the flood should come to swamp and ruin his work. There was a heap of comfort in that. One could almost contemplate with equanimity a ruined operation for the pleasure of seeing his disgust and chagrin, and to hear his remarks, providing he didn't go into the laboratory to make them. I well remember how, after each succeeding operation, I would get up out of the chair as limp as a dishrag, from the nervous tension and the loss of several gallons of saliva, and with all the energy left, most solemnly declare that the man who would voluntarily and in cold blood subject himself to such trials just for the sake of a tooth was an unmitigated jackass, and I hoped the doctor would kick me clear out of his office, into an idiot asylum, if he ever caught me doing it again! And I am quite sure the doctor was most fervently hoping he'd get the chance speedily, for, be very sure, he had been having just as nerve-racking and trying a "picnic" as the patient. A large personal experience at "both ends of the instrument," says so.

And do you know, I think that much of the wild dread of the dental chair at the present time is largely a heritage from those days, largely due to the almost inhuman demands made upon the endurance of the patient in the interest of extensive and thorough operations. To save a tooth with the very largest of cavities according to the best accepted professional standards was to fill and build them up with gold. No self-respecting ethical dentist would jeopardize his standing by recommending amalgam—not if he was likely to be found out! Capping, or crowning was not yet invented and inlays not yet suggested. The only way was to start from one or more retaining pits, and by slow, painstaking and tedious malleting, laboriously weld one small pellet of gold to another, from the bottom up, until the operation was completed.

Heroic operations of two, three or even more hours' duration were not unusual, and were pointed to with pride. The more extensive the "restoration," the greater the monument to his skill and endurance. Small wonder that the patient became saturated with an almost overpowering dread of anything and everything pertaining to the dental chair, which has given it a reputation out of all proportion to its deserts. So often does it happen that it is almost the rule in every office to have patients face us in a panic of fear and trembling, and leave us in grateful appreciation with the stereotyped assurance that had they known "it wouldn't hurt any more than that" they would have come long ago. And this, too, from patients who had never in their lives suffered any more from dental operations, and had always gone away saying the same thing—and who would in the future repeat the same experience de capo. There is no question, the methods of today are much milder, make much less demand on the endurance of both patient and operator than those of yesterday, and yet the dread remains. It is largely a heritage.

In looking over the literature of thirty or forty years ago, and especially the reports of society transactions, on can not fail to be impressed with the great change in the feeling existing between the different members of the profession then and now. Most of these proceedings were necessarily but imperfectly reported from notes jotted down by the secretary during the discussions, and yet some of them, even after being pruned and toned down by the reporter, were highly suggestive of brimstone. For instance: The subject under discussion was the treatment of children's teeth, and incidentally, capping pulps.

The first speaker thought it quite necessary to save deciduous teeth, but did not favor destroying their pulps with arsenic. It prevented absorption and he would rather extract a tooth with exposed pulp than destroy and leave it. This precipitated a debate in which No. 3 in effect told No. 2, who had disagreed with No. 1 and didn't believe in capping deciduous pulps, that if he understood his business he would be successful, as he (No. 3) himself was, and told him how to do it, and No. 2 retorted in effect that he didn't believe the claims of No. 3 and thought him a humbug. No. 4 was drawn into the controversy on account of some contemptuous allusions to his pet theory and as he claimed successful practice of excising part of the pulp, cutting a V-shaped piece out of the end and bringing the two flaps together and then capping. No. 2 had spoken of this as "scalping" and "gouging." This riled No. 4 to such an extent that he told No. 3 that some of the methods he had just been advocating be considered contrary to sense, science and good practice, and he objected to the use of such slang terms as "scalping" and "gouging" to describe a scientific operation, and he denounced it as "unprofessional" and "ungentlemanly." No. 3 may be said to have "gotten it in the neck" still further when No. 2 denounced him as guilty of malpractice. I take it for granted, that the use of slang in connection with No. 3 is allowable, as he evidently wasn't a "scientific subject." However, the troubled waters calmed down, and the lion and the lamb lay down together later on when the three disputants were appointed a committee to prepare a code of ethics for the society, which they did.

Reading between the lines of this comparatively brief and colorless report one can get a pretty fair idea of the intense feeling of intolerance and lack of respect that must have prevailed between a good many of the members of the society at that time, for it is fair to infer that much more was said and felt than appears in the report.

I came in seven or eight years after the above episode. By that time the leaven of social intercourse had brought about such a change that I believe I can truthfully say, that in all my thirty-two years' attendance on this and other society meetings, I never heard such an interchange of amenities as is indicated in the above. There is much less dogmatism, less intolerance of antagonistic views, more respect for each other, a broader feeling of charity, evident in the discussions now, the natural and inevitable result of association. Members have met each other year by year, and have learned to know and respect and like each other thoroughly. I have often heard heated discussions, where it was give and take and where the feeling was strong on each side, that it was right and the other was wrong, but I have yet to hear any one denounced on the floor in discussion, as a quack, a humbug or ungentlemanly, or unprofessional. Had any one done so, it is safe to say they would have been promptly called down. The amenities have been observed.

Now the thought I wish especially to bring out, is that this mutual feeling of respect, and helpfulness is not the least of the benefits arising from attendance at society meetings. It is worth more to every one of us, individually and collectively, than all the helpful hints, and facts, and thoughts to be gathered here so freely.

Now, one more thought, with your permission. In looking over these discussions, it is instructive to see how strenuous advocates of one mode of practice would, in the light of subsequent experience, be compelled sometimes to reverse themselves and then again perhaps reverse themselves again. These changes were more often in the direction of methods than principles. One of the most conspicuous examples of this was the use of the file, alluded to by the essayist.

In the very earliest days the file was freely used. Later on a prejudice arose against the practice until Dr. Arthur published his book advocating separation for prevention with V-shaped spaces, intended to facilitate removal of food, and the cleansing of the proximal surfaces. The theory was presented with a plausibility that gave it a sort of pseudo scientific air, and very many of the leading men in the profession accepted and advocated this, as Dr. Crouse truly observes, most vicious of doctrines.

I speak feelingly, because I happened to become a victim of one of these up-to-date dentists, who thought he would try it on me to see whether the theory was correct. I proved its unreliability, with the loss of every tooth but one so operated on. Now I very much fear that Dr. Crouse's skirts are not quite so clear of this heresy as the language of his paper might lead us to infer, for if the reports are not in error, he was very much in evidence as a supporter. He strongly commended Dr. Arthur's book to the serious consideration of the profession. He even wrote a paper on "Separating teeth," taking advanced position in his advocacy of wide separations, especially in the ',back teeth of adults."

Even our own conservative, and as many of us are prone to think, almost infallible, Dr. Black, went so far as to say that he was disgusted with the theory when he first read the book, but that after studying it he had modified his views, and he now saw good in it. However, with his usual caution, he threw an anchor to windward and perhaps saved his bacon when he added that of course harm might be done in improper cases, but a great deal of good in proper cases. The elasticity in the terms "proper" and "improper," where each one must be his own judge, is amply sufficient, you know, to pull one out of almost any hole! Dr. Black did not specify what he meant by a "proper" case, and therefore left himself in position to say later on, if he wanted to, that undoubtedly the theory would be all right in a proper case, but he had never seen a case he considered proper! Dr. Crouse, on the contrary, with his usual impetuosity, threw caution to the winds and plainly specified what cases he considered proper, and unfurled his banner on the outer walls in plain view of everybody. He never beats about the bush, anyway. This attitude he maintained consistently, according to the records, for some time, until having had some experience in his own mouth, he became quite lukewarm—wasn't quite so sure, and I believe very soon became completely cured like the rest of us.

As a further illustration of what would appear to be a complete somersault is Crouse in 1875 recording his solemn conviction that "if there had been no such thing known as amalgam humanity would have been better off!" And Crouse in 1906 manufacturing tons and tons of the most popular amalgam in the market! Now the history of the profession is filled with just such reversals, and I am not calling attention to them here as illustrations of inconsistencies, or of anything else that could in the least be construed into a reflection on their judgment or to point a warning even for greater caution. Quite the contrary. The point I want to make is just the reverse. These changes of attitude, instead of being a reflection, are a credit; instead of showing weakness, they indicate strength and activity, and are as necessary to growth as air is to our existence. Dr. Crouse himself met the question in exactly the right way when he was at one time twitted with advocating what he had previously denounced but a short time before. They thought they "had" him, and of course there was a laugh at his expense. Now, when you want to "get" Dr. Crouse I have observed it is quite necessary to get up early in the morning; in fact, the day before wouldn't be any too soon. Yes, he replied, he knew he had advocated other modes of practice at previous meetings, and he regretted if he had done harm by so doing. Nevertheless, he always reserved the right to change his mind when he found he was wrong, and if during the coming year new light, new knowledge should cause him to change his mind again, he wouldn't be afraid to admit it. Now, there spoke the honest seeker after truth, the student who was more concerned to be in the right than to try to impress others with his infallibility. This is the very essence of the spirit of progress. He writes himself down a stupid ass, who having once nailed his flag to the mast, obstinately defends it, in spite of changed conditions, just to be consistent. Without a mind wide open to conviction, progress is impossible.

And this is the point I have aimed to bring out for the especial benefit of those who have lately joined with us and who are on the threshold of their professional or society careers, I say to you, it is your duty to be in the thick of it and know what is going on. If a new theory or new method is suggested, it is your duty to see what there is in it. You don't want to wait for others to investigate for you. He who stands back and waits for others to find out first whether this method or this practice is a good thing, isn't worth a "hill of beans," either to himself or his profession. He is losing a lot of valuable time and thereby checks his growth, stunts himself, stays in a rut, becomes a back number, and finally dies of dry rot. You want to be a "helper," not a "learner," as Dr. Thorpe once poetically expressed it. If there is anything advanced that may enable you to do better work and serve your patients better, you want to "get onto it" at the very earliest moment. You can't afford to wait and let others get there first. You want to be in the van; you don't want to struggle along in the rear—and when you once have satisfied yourself that a method or theory is right, you want to advocate it and make others see the right. Suppose you will have to reverse yourself at times. Suppose you do have to "eat crow" at times; that's all right. You will be in good company. Crouse and Black and the host of others who have made their marks in the profession, all have "eaten crow" in their time, and will continue to do so, it is safe to say, as long as good red blood flows in their veins, and they are good enough company for anybody. They haven't lost standing because of it. "Chewing crow" is good for the teeth and stomach. It will only strengthen your digestive apparatus and you will be all the better able to cope with and assimilate subsequent propositions as they come up. The mere effort expended in personally investigating and experimenting is worth more educationally than the study of either books or lectures.

Dr. R. N. Lawrence, of Lincoln:

Mr. President: Owing to absence from home, returning in time only to attend this Society meeting, I did not have the pleasure of reading Dr. Crouse's paper, hence I am not prepared to comply with our worthy secretary's requirements in the matter of a written discussion.

I have enjoyed the paper exceedingly. It is a clear and comprehensive presentation of facts and experiences familiar to all of us older practitioners. After listening to Dr. Black and Dr. Rohland it is needless to attempt to add anything in that line. Therefore, under the circumstances, may I be pardoned by this Society if I indulge in a bit of personal history, and then speak of some of the benefits derived from the wonderful changes and great progress made during the period mentioned.

Forty years ago I was a student in the office of Professor Taft while taking a course in the Ohio College of Dental Surgery. I have been in active practice for thirty-eight years and I am not ready for the Osler bottle.

Soon after graduating I went South and remained until the Yellow Jack drove me out. I returned to Illinois in 1878 and in 1879 joined this Society. I can recall to mind the many struggles during those earlier years of practice and of my earnest endeavor to render good service with hand instruments alone and without the rubber dam. I can recall the want of advice or support and sympathy from the older practitioners around me, also their secretiveness and jealousy. When I approached one of them for counsel or assistance he wrapped the mantle of self consciousness about him and said, by looks, if not in words, disturb me not; patent applied for. (Laughter.) Gentlemen, how do we find it today here in old Illinois? Permit me to use Chicago as an illustration. We, and the we not only includes myself but hundreds of fellow practitioners throughout the country, have realized when visiting Chicago, that it matters little who greets you, whether he be one of the old stage horses, like Walter Stevens, or a bucking broncho like Don Gallie, or a dignified professor from one of our great colleges, or a Woolley man from State street, we find the latch string on the outside and a warm welcome on the inside. (Applause.)

We have lived to witness the growth and development of the Illinois State Dental Society until it stands without a peer in all the world; likewise the founding and successful maintenance of some of the very best dental schools and dental journals to be found on this continent; also the organization of the Chicago-Odontographic Society, whose influence has done more to support and strengthen the work of this Society along practical lines than all other forces combined, and their influence is not confined within the borders of this great State. My heart grows warm when I recall the history of the great Odontographic Society from small beginnings until it reached, it seems to me, the zenith of its glory during the Johnson dynasty. Who can forget those balmy February days when our brethren came from all over this country. They came from Canada; they came from Texas without their overcoats; they came from Arkansas wearing their summer underwear. When the cry came "To your tents, oh, Israel," from the tribe of Odontos, we knew another link was to be added to the chain of events which makes this Society great. Notwithstanding the unprecedented attendance at this great meeting, hundreds upon hundreds of our fellow practitioners throughout the land seemed content to remain at home and did not avail themselves of the profit of such a meeting, missing the opportunity of meeting and touching elbows with representative men from all over the Union. The only explanation that can be offered regarding their indifference to society work is that they failed to realize how much they missed or how great were the benefits to be derived. May the Lord grant the time shall come when the hearts of such shall become as soft as their heads. (Applause.)

DR. E. K. BLAIR, of Waverly:

Just a word in reference to this paper. I have enjoyed it very much. I was a student at the Missouri Dental College when Dr. Judd, Dr. Eames, Dr. Forbes, Dr. McKellops, and the elder Dr. Chase were members of the faculty. We had clinics occasionally, and one of them I wish to mention was given by Dr. Forbes. He was one of the older members of the profession, a most elegant gentleman, and was earnest in everything he did, and was most thorough in workmanship. He undertook to demonstrate the necessity of separation of teeth. He had a set of files he manufactured himself, and his hand was strong and his arm stronger. The patient was a young man who would not stand for everything. After the doctor made three or four passes at him and managed to get through the first file in opening up a V-shaped space, he turned to the class and spoke of the absolute necessity of such a procedure. At that time the profession was giving up the idea of that class of work, while Dr. Forbes was still adhering to it. While making his remarks in defense of this procedure the patient quietly slipped out of the chair, and to the doctor's dismay the clinic was ended. The patient had gotten out of the door and there was an end of it. For an instant it was amusing, but when the class reflected upon how much Dr. Forbes' feelings were hurt, there was not a word said about it. That was the last separation of that sort I remember having seen.

Dr. C. R. E. Koch, of Chicago:

Mr. President, Ladies and Gentlemen—I think pretty nearly everything has been said here that is worth saying at this time in connection with reminiscences, excepting that there is one coterie of gentlemen who probably did more for this Society toward establishing its amenities and for putting us on a higher plane than any of the men whose names have been heretofore mentioned, and they ought not to be overlooked on this occasion. I recall that glorious galaxy of gentlemen who practiced dentistry right across the river, in St. Louis. (Applause.) There was Forbes, whose name has been mentioned; also Eames, Chase, McKellops, Morrison, Spalding and Fuller, and the Nestor of them all—Homer Judd. I believe that Homer Judd gave greater inspiration to scientific investigation to the Society than any man in the community up to that time, and now we have our great and distinguished Dr. Black and others, who are his worthy successors. His lines, of course, were in different directions, investigations in the fields of histology and special pathology. We ought not to forget those gentlemen who came over here and gave us inspiration—they were a happy family.

Dr. Rohland spoke of the amenities existing in Chicago at that time, and the picture is by no means overdrawn, because we had several gentlemen each of whom thought they were wiser and more distinguished than the others. Very early in the history of the Chicago dentists they attempted to get together to agree upon a fee bill. I think it was before the formation of this Society or the Chicago Society, and nearly all of the practitioners of that day were present and held a meeting and agreed on a fee bill, and after their agreement was duly signed, one distinguished practitioner came in and excused himself for having been delayed with his professional work, saying he could not get away sooner, and informed them that he agreed with them as to the fee bill if they would put in a clause authorizing him to charge 25 per cent more. He was one of the earlier disturbers of the peace. Peace was never fully restored until after the St. Louis phalanx came and leavened the entire loaf, and Chicago now, I think, can give St. Louis cards and spades as to how brethren can live together in unity. (Applause.)

Dr. Crouse (closing the discussion):

I never brag. (Laughter.) But I do sometimes make a mistake. I have no doubt I have made as many of them as anybody, because I have been rushed; but I have done many things which could not be considered as mistakes.

I want to say a word or two on the amalgam question. It may not be remembered by you that I was the first to put a tested alloy on the market. It was my work. I worked at it for three or four years with the help of a metallurgist. I went to Wisconsin to give a clinic. I asked every member to bring half an ounce of amalgam with him. I took my tubes and micrometer with me. They appointed a committee to investigate. I made tests, and these men felt that there was no amalgam used at that time that did not shrink. There was no amalgam used at that time that would not drop out of the tubes after three or four days. The amalgam of that day was not fit to use. That was a number of years ago. If you will look over the report of the New York State Dental Society (I do not know whether it has been published or not, because I advised them not to publish it) of the tests they made of amalgams, you will see that they confirm what I have said. So much for amalgam. I never brag. (Laughter.)

Reference has been made to the instruments that were used in earlier times. The most important thing that has happened in the improvement of instruments is the bur. Do you remember that the burs which were sold for $48.00 per gross were hand made? There was not a scientific principle laid down in the construction of burs at that time. What brought about the change? I brought out a machine made bur that was made on scientific principles. I put it on the market at one dollar. I never would have mentioned that if Dr. Rohland had not accused me of going wrong. (Laughter.)

I want to go back at the beginning. I went into the office where a practitioner did nothing but extract teeth and make rubber plates. I was in the office six weeks, and at the end of that time I could make a rubber plate as well as he could. I graduated from that office and went into my brother's office and read medicine, and I expected to practice medicine until I was asked by my brother to go a distance of thirteen miles where there were four patients down with typhoid fever. It was over a rough road. I had to go there on horseback. There was not enough food in the neighborhood to keep the patients alive. I went home and resolved never to practice medicine. This was a most sorrowful sight to me. I could never get over it. That was what put me in this Society. I found there was something in dentistry. I wanted to practice law, but my mother was opposed to that, and on her account I did not adopt law as a profession, and I took up the next worst thing—dentistry. (Laughter.)

Speaking of large restorations with gold, Marshall H. Webb was going to give a clinic at the American Dental Association, and he told me to get the cavity ready, and as time went on he found that his mallet would not work right, and he asked me to drill some retaining pits and start the filling. I took three sheets of gold in cylinders, started to insert some pellets, and got someone to mallet for me. It took him nearly half an hour to get his apparatus ready, and by the time he was ready I had the tooth nearly three-fourths filled. He never forgave me for doing that; but I thought it was a good joke.

For forty-one years I have attended the meetings of this Society, and what success I have attained I owe very largely to the influence of this Society. But I can tell you that I have attended societies that do not work as smoothly as this. In the Chicago Dental Society at one time there were two men who called each other liars, one of whom was knocked down senseless by J. Ward Ellis. When I spoke of the members of the Society working in harmony I meant what I said. You will not find many societies like it. There was one man whose name has not been mentioned today, who did more than any one man to harmonize the differences that then existed, and that was M. S. Dean. Those who never had the pleasure of his acquaintance while he was living, do not know what they missed. He was an intimate friend of mine. He was buried from my house when he died, and his influence in Chicago and in this Society is felt here today.

I wish to say to the young men here, do not sit around and find fault. You won't get any good from that. Make a mistake and correct it. That is what will help you. (Applause.) That is what the members of this Society have done right along. The men here have made a lot of mistakes and have corrected them when they could. If you make mistakes and do not correct them, it will not help you. I have profited a good deal by correcting the mistakes I have made.

DISCUSSION OF DR. PRUYN'S PAPER.

DR. M. L. HANAFORD (Rockford, Ill.):

The universal dread of pain and the necessity for the infliction of more or less pain by the dentist in his operations, has caused untold suffering to the human race and the loss of thousands of teeth. We and our patients are wont sometimes to think that if only the element of pain could be eliminated from our operations, life would henceforth be a continual round of pleasure. We are often asked by our patients, why has not some way been invented by which cavities in sensitive teeth could be excavated painlessly?—the implication being that the dentist is unsympathetic, if not indifferent, to suffering. They express surprise when told that everything possible is being done in that direction that can be done safely and the hope expressed that some day truly painless dentistry will be an accomplished fact.

It is said in lines of trade that a demand brings a supply, and in our profession, which some way is part trade, the argument is that a like supply should follow the universal demand. All over the land unscrupulous charlatans are trading upon the dread and fears of the people. New systems of painless dentistry are advertised on fences and dead walls, catching the eye and purse of the unwary; and the credulous people flock to those charlatans because they are told something they want to believe, that good dentistry can be done painlessly. Since this is true, it is small wonder that the use of anaesthetics is being pushed to the limit. Dentists are human, some of the people to the contrary notwithstanding, and if they can substitute smiles for groans and compliments for execrations, the temptation is great to overstep the bounds of caution.

Recognizing the above as universal traits of human nature, the paper to which we have just listened comes as a timely warning to us. It requires courage to refuse an anaesthetic. You may be thought timid or incompetent or unfeeling, you may lose a patient or a family, so you are tempted to take the chance. Remember, it is a chance and responsibility which no one can divide with you. Can you afford it? As the essayist well says, suppose you should have a fatal result, and should be called before the coroner, what would your defense be,—that your patient dreaded the momentary pain of tooth extraction, and you hated to refuse the anaesthetic? How many dentists could stand before what I would imagine the first question asked him—namely, Are you qualified, and did you examine the patient as to his fitness to take an anaesthetic, or had you all the recognized means of restoration at hand and did you make use of them? As a general anaesthetic, nitrous oxide gas probably ranks first in point of safety, but as generally used there are disagreeable features about it, notably more or less struggling and the shortness of the anaesthetic period. This has led to the large use of cocaine in various combinations, by hypodermic injections. The enormous consumption of these preparations by so-called dental parlors and careless operators must have been the cause of untold injury, for we know that careful men often meet with accidents of more or less gravity.

It is especially fitting that a note of warning should come at this time from the man who gave the profession the first scientific studies of the action of cocaine on man and the lower animals. Many of us remember the paper which Dr. Pruyn read at the twenty-fifth anniversary meeting of the Chicago Dental Society, in which he described in detail experiments on a large number of dogs to whom had been administered various doses of cocaine. The note of warning, even then, was not wanting, and the opinion was expressed that no one should use the drug who was not familiar with the symptoms of poisoning, and even had witnessed some deaths from its use. The use of opium as an antidote was recommended, and I believe that stands today as correct practice. As I said before, I consider this paper especially timely in view of the presence of so many young men. The ability to successfully use anaesthetics has been thought, and doubtless is, a practice builder. Young men are supposed to be in the practice-building business. The lesson of the paper to such is, I take it, first, see that you are thoroughly qualified, if you would use an anaesthetic extensively, and that means ability to select proper subjects, as well as how to use the agents. Second, to hold strongly to the safe side of the equation.

DR. E. F. HAZELL (Springfield):

I want to congratulate Dr. Pruyn for the good paper he has given us, and the Society on having in its membership one who is able to take up so many different topics and speak in an authoritative way.

The paper is calculated to set us all to thinking about how recklessly we sometimes use the different agents at our command, and especially those which should be used cautiously.

What should we do in case of an accident? A death may take place in the office of any one of us, and as Dr. Pruyn has said, unless we are able to answer satisfactorily the questions of a good lawyer, the courts may deal with us not entirely to our liking.

The cry of the times for "painless dentistry" by so many of the laity and some few of the profession is hard to meet. And I doubt seriously if we will ever be able to do all our operations in an absolutely painless manner. We need pain as a warning, for instance, of our near approach to an abnormally large pulp.

It has been a wonder to me that much more trouble than we have seen has not resulted from the promiscuous use of the hypodermic injection of Tom, Dick and Harry's local anaesthetic.

We do not know what the ingredients of these nostrums are, and are absolutely in the dark as to what has been injected.

I have seen toxic symptoms manifested from a very small quantity of cocaine, and naturally have become guarded in its use.

The paper has been of benefit to me, as I trust it will be to many others.

Dr. H. W. McMillan (Roseville) :

Dr. Pruyn has given us an excellent paper. Its keynote is conservatism. It calls us to the serious study of the subjects considered. Anaesthetics, sedatives and narcotics are dangerous unless properly used, and one who employs them should first of all familiarize himself with their composition, their nature, their limitations, the indications for their use and their antidotes.

We should gain scientific knowledge of whatever we use, and act in harmony with it. A whole sermon could be preached upon the evil resulting from conducting our lives out of harmony with scientific principles. Science is exact knowledge classified, and as scientific dentists we should possess the exact knowledge of the proper uses and the limitations of the drugs mentioned in this paper.

Dentists should not cease to grow in knowledge of these and allied subjects, and a complete and well selected dental library should be in every office. There are times during office hours when some patient has failed to come, which can be very profitably spent with the books on the various subjects of dentistry.

Anaesthetics, sedatives and narcotics are of great interest to the dentist. Anaesthetics are general and local. Regarding their use dental opinion is divided. Some prefer general anesthesia, others local, others both, and some others neither. Personally, I like to use both general and local, according to the indications. I have secured good results from somnoform and from nitrous oxide, and also from cocaine.

I use sedatives to a limited extent, believing drugging the patient should be done as little as possible. If the dentist can make his patient know that the pain will be just as slight as is consistent with thorough operating, he has done much to control that patient without drugs of any kind.

If the dentist can persuade his patient to come at regular intervals for the examination and care of the teeth, there would be much less need of drugs, and consequently less misuse of them. There would also be much less bridge work and its abuse and misuse.

Cheap dentistry, cheap extractions, cheap plates and the whole catalogue of cheap things in the dental line are responsible for much of the evil mentioned in this paper. A man who knows he is cheap does not take a pride in his knowledge. He works from the neck down, and is yet a tradesman, while he who works with his head as well as his hands—he is the professional dentist, and to tell him he is cheap is to insult him.

If people had to pay their dentist one dollar for each tooth extracted, and to the United States government a like amount for a fund with which to educate them to the value of the tooth they have lost, we would soon cease to deserve the title of "tooth pullers," and the name dentist would be synonymous with tooth saver. The United States government recognizes the value of teeth in the selection or rejection of its soldiers. It derives revenue from liquors and tobaccos, both acknowledged curses, and I would have every patient who has a permanent tooth extracted buy a revenue stamp also. Tooth extraction is a curse and should be taxed.

Cocaine should not be injected around an abscessed tooth, and when it is used the mucous membrane should be cleansed with antiseptics and the needle should be passed through a flame.

I believe dentists would better serve their patients to never use coffee, tobacco or intoxicants. None of these are necessary, and may lead to serious results. Our patients should receive our best services, and this can not be given while using these things.

I take exception to the saying that the "unexpected always happens," and suggest that "the unexpected sometimes happens," which is more near to the truth. We should, however, be ready to act wisely when the unexpected does happen.

I am glad dentistry is a growing science and that greater things are expected of us each year. We should increase our knowledge of these subjects and eliminate our errors of the past. This can be done by scientific comparative tests and by clinical experience. I agree with Dr. Pruyn that anaesthetics, sedatives and narcotics are valuable and safe if only used when needed and intelligently given.

Dr. Geo. W. Haskins, of Chicago:

The public seems to feel that if we would we could produce painless dentistry, but if there is any danger of serious permanent disorder following the use of a local anesthetic it does not seem to me that we are warranted in taking any chances. In any work where permanent disability or permanent injury to life might result from the lack of an anesthetic its use is advisable, but where it is used habitually to allay all pain it is hardly warranted.

Dr. Hazell, Dr. Pruyn, and one other who discussed the essay mentioned the possibility, if death should follow the administration of an anesthetic by a dentist, that he would be placed in an embarrassing situation. It may be well to state an instance that happened in Chicago some years ago, where a dentist was called upon by a patient to extract a wisdom tooth which had been broken off by a neighbor the previous day. The gums were so swollen that he could hardly see it. The crown was gone. He called to his aid a physician in the same suite of offices. After the physician had made a physical examination of the patient he decided that it would be safe to administer an anesthetic, and he administered chloroform, previously stating to the patient what his (the physician's) fee would be. The patient died after a few inhalations. The coroner's jury sitting on the case exonerated the physician. They also claimed that they could not hold the dentist because he had not done anything, but they did see fit to reprimand him. For what I don't know. This was an actual case. The papers published it in full, and in the interest of the young man, that his practice be not dam-aged, a committee was appointed to see the newspapers and ask them if they would not rectify the error which had been made in censuring the young man unjustly, and the reply we got from the newspaper men was: "Oh, well, that happened two or three days ago. That is all dead news now; if you want it straightened out and a correct report made we will do it at the regular advertising rates."

Dr. Otto Holinger, of Chicago:

I always feel that whenever pain can be prevented it should be, and I think under modern training and science very little pain is necessary. In the handling of all dangerous drugs, under modern facilities for learning there is no excuse for the man who pretends to be a professional man in the line of dentistry or medicine not to know those things in a practical way. No amount of book knowledge will teach a man sufficiently without practice. Having had an extensive experience in hospital work where anesthetics are administered for a great many desperate cass, with an occasional death, a great many things are learned which are apt to put one on his guard. But in dentistry, unless one had a major operation, as an excision of a jaw, or a carcinoma, for instance, or some such thing as that, complete anesthesia is absolutely contraindicated. You can put the patient in the so-called talking anesthesia, in which they will not know anything about it after they wake up.

The administration of an anesthetic is, I think, of great moment. Dr. Bevan, one of the professors of surgery at Rush Medical College, made the statement that he believed there was hardly an excuse for the secondary state of excitement in the administration of a general anesthetic, and I agree with him. The average patient that comes under an anesthetic is nervous. If it is given in a dental chair with the patient sitting up, of course it is very bad, but if you exercise that training which the man who deals with patients who are usually conscious acquires in a short time you can, by administering an anesthetic very slowly, gain the patient's confidence, put him to sleep very nicely, and there is very little if any trouble. As a rule this applies to chloroform, but to ether also, although some people do respond a little less pleasantly to ether than chloroform. The average dentist, with the average training in a dental college, I hardly think is competent to administer a general anaesthetic, and should not be expected to be. Instead of having the chair of anaesthesia as a sort of heading to fill up a very attractive report the teaching should be done earnestly and in a deserving manner.

As far as local anaesthetics go, if one takes precaution in his asepsis, and by the way that is so easily done that there is not excuse for the dentist not to do so, for he may keep his needles in a solution of carbolic acid for four or five hours, and then in alcohol to neutralize the carbolic acid, and kept there until they are to be used again. Then the mouth should be washed out well just before the injection is made and only a small amount of local anaesthetic used, relying mostly on the pressure anaesthesia, and there is no danger in the proper solution of cocaine. We know now definitely the dose of cocaine, barring idiosyncrasies, and these usually manifest their peculiarities in the early stage, so if you work slowly you will find them out, and a great deal can be done to prevent trouble.

I was called in by a brother dentist some months ago who had applied cocaine to a patient to put on a band. He had literally swabbed the whole mouth with a 5 per cent solution of cocaine in order to make the fitting of the band less painful. The fauces, even, were anaesthetized. Of course local anaesthetics must not be condemned on account of such misuse as that. There is a distinct advantage in taking pulps out under cocaine anaesthesia, and in extracting the average tooth I rely upon local anaesthesia, because you can take your time, whereas under nitrous oxide anaesthesia you must get through quickly.

The human mouth has a larger circulation, perhaps, than any other part of the body. Things are absorbed quickly, and if an anaesthetic is applied carelessly it can do a great deal of harm, and yet I will say that the mucous membranes and the tissues in the mouth stand a great deal more punishment than probably any other portion of the body.

There is a distinct place in dentistry for all the kinds of anaesthetics, the same as in other branches of medical practice, but a thorough knowledge of the material used, gentleness and kindness toward patients, cleanliness and plenty of time, are the essential principles to follow in their use.

Dr. G. W. Cook (Chicago):

The first time I ever saw cocaine used I saw it used by Dr. Pruyn, and the results of some of his work at that time he will well remember. The paper brought out the point that one under an anaesthetic is very near to death. They sometimes get there. I was in a hospital, the other day, where they were operating under a general anaesthetic. Ether was given. All the necessarv examinations and precautions were taken, and there were no constitutional or organic difficulties pointing to any reason why such an anaesthetic should not be given; but in the first stages of the ether anaesthesia the patient simply passed away, did not stay long. So we see that the dangers of the first stages are not entirely eliminated.

The sloughing that sometimes follows cocaine injections is due, of course, to infection, and I think no precaution that any one might take would absolutely prevent that, for two reasons: First, you have anaesthetized tissues in the way, and you place them in a condition in which infection can take place several months, even, after your operation has been performed, and if you have profoundly anesthetized that tissue you have rendered it extremly liable to infection, so that with all the precautions that you might take infection is possible to follow.

It is, of course, unnecessary to state that it is bad practice to put a person under a general anaesthetic while in a dental chair, and the case that Dr. Haskins has reference to I recall very well. I think it is the same one where I called upon the dentist as soon as I found out the misfortune that he had had, and I recall how it was thought that the dentist, while he could not be held, at the same time there was a little point of criticism.

Dr. Logan:

The dentist did not touch the patient.

Dr. Cook:

I have appreciated this paper of Dr. Pruyn's, and the warning he has given, and I am glad we have had him here to warn us.

Dr. C. E. Bentley (Chicago):

Mr. President: I want to add my tribute of respect to Dr. Pruyn because of his early endeavors toward giving us some authentic data concerning cocaine and its effect on the system. I was one of those few fortunate individuals that had an opportunity of seeing Dr. Pruyn work on animals, and after seeing the results of that investigation I commenced the extraction of teeth with a 4 per cent solution of cocaine, and I kept that up until finally I was compelled to stop it by a startling incident which occurred in my office, an account of which has been published. Suffice it to say that the man lost the power of co-ordination for four days, lost visual power, and he was in a comatose condition in my office from two o'clock until seven. It was a remarkable case of cocaine poisoning. Since that time I have been very careful about cocaine, and I don't use it very much. I believe there are some solutions of cocaine on the market that are safe.

In regard to injecting poisonous material from a dirty syringe, it is reprehensible and unpardonable for any gentleman to use an unclean syringe in injecting cocaine for the temporary anaesthesia of any part; but I take no stock whatever in what I heard here this evening regarding the attempts at sterilizing a part. The heating sufficiently of a needle in a flame will sterilize it, but the mere swabbing of mucous membranes with an antiseptic, with the hope that you are going to sterilize it, having septic fingers, septic clothes and a septic chair, is the merest farce at asepsis. You can not sterilize an area of gum tissue by merely swabbing it over with an antiseptic solution. It has got to stay there and inhibit growth for a long time. The organisms may be in the crypts of the mucous membrane.

I don't think that any dentist is warranted in giving a general anaesthetic. I don't think that a physician, unless he has served an interneship, is warranted in giving a general anaesthetic. The hospitals of the various countries have recognized the force of that statement to the extent that they have what they call authorized anaesthetists. In London and in France the stamp of approval is placed upon every man that gives an anaesthetic in a hospital. They usually commence their anaesthetic with nitrous oxide, and finish with ether, or more commonly, the A C E preparation, alcohol, chloroform and ether.

The young gentleman spoke fervently about anaesthetics being given by medical men. Medical men are no more competent to give anaesthetics than dentists, not a bit more. (Applause.) I happen to know what I am talking about. I have a hospital experience of over fourteen years in the city of Chicago, and I tell you the internes that come to the hospital have to be drilled and drilled and drilled before they know how to give an anaesthetic, and even in spite of that deaths occur.

Now, therefore, I say that the dentist hasn't any business to give a general anaesthetic, and I don't think that it comes within his province. I think that should belong to the domain of the physician, and I should certainly counsel a man, and particularly the younger men here, that when you require an anaesthetic be sure and have the responsibility shared by a medical man.

One of the most surprising things to me in the paper is that Dr. Pruyn is robbing me of a great many of my pleasures. He says of the man who drinks coffee and smokes cigars, it is dangerous, dangerous, dangerous. I want to say that Dr. Pruyn's remark with regard to that reminds me very much of an old colored lady in the south, who was living in a shack, and was busy with her household duties, when there came a rap at the door, and a formidable looking citizen stood outside, and the old woman said: "What do you want?" He said: "I have come down here to take the census." "What is that?" she said. "I have come down here to take the census." "For the Lord, for the Lord! You white folks done take away my freedom, and you done take away my dollars, and now you come here to take my senses." (Laughter.) So I say to Dr. Pruyn, please spare me my coffee and my smoke. (Applause.)

Dr. W. H. G. Logan (Chicago):

The gentleman stated that we don't know anything, and therefore we should not take any chances. Dentists discovered or made known ether and nitrous oxide, and a medical student gave us chloroform.. Whatever is got out of nitrous oxide and out of ether is got out of dentistry. We gave them to the world. I believe that the shock that is necessary to extract three or four teeth, sometimes one tooth, is more harmful than the giving of nitrous oxide. I believe it is wrong to tell these young men that you shouldn't do something to relieve pain. You must relieve pain in every possible way. I wouldn't say give chloroform to extract teeth, because that is wrong, and it has been a long time proven wrong, but you should give nitrous oxide or you should use a local anaesthetic. When you do use it, know the amount of the drug you are injecting. It is not how much solution you use, but how much of the drug do you put in. Put in a little of the drug in a great deal of water. That makes local anaesthesia. You must do something to relieve pain in dentistry or you are not living up to the precepts you should live up to, and it can be done by giving nitrous oxide through the nose while operating.

Dr. Arthur D. Black (Chicago):

A few weeks ago I had the pleasure of hearing a paper on anaesthetics by a medical man, expert anaesthetist, and the fact was developed that there are more dental schools in this country giving regular courses on anaesthesia than medical schools. There is not a medical college in the city of Chicago that gives a definite course on the administration of anaesthetics. The only teaching the medical men get is in watching the giving of anaesthetics before classes. In most dental schools there are regular courses on this subject. I wonder if our medical friend has ever thought of the fact that dentists give anaesthetics probably five times as much as physicians?

It seems to me that we should administer many different drugs for the relief of pain; we should study the case and use what may be best for that particular case. I think Dr. Logan is in error in saying that we should not give chloroform to extract teeth. There are many cases where we are perfectly justified in giving chloroform or ether. There are other cases where we would not be justified in so doing. There are cases, particularly impacted lower third molars, where an injection of cocaine, or some cocaine preparation, is often preferable.

In the injection of cocaine we should in every case know the exact amount of cocaine we are using. We should use a definite tablet in solution, rather than a percentage solution from a large bottle. If we have a percentage solution, we are more uncertain as to the actual amount of cocaine we administer than we are if we use a tablet of a quarter or half a grain in our hypodermic.

There is another element in the use of local anaesthetics, and that is the psychical element. Frequently teeth can be extracted absolutely without pain by the injection of a normal salt solution. We get the psychical effect and in addition quite a little anaesthetic effect.

Dr. Brunson (Joliet):

I understood Dr. Bentley to say that we can not sterilize a certain area in the mouth sufficiently by swabbing with an antiseptic so as to prevent danger that the hypodermic needle may carry infection from the surface into the deep tissues. I don't agree with that. We take less pains with our solution, and yet we will force that right down through the gum. I think there are medicaments that will reduce to a great extent the danger of carrying into the deep tissues dangerous forms of life.

Whenever we use an anaesthetic that will rob us of consciousness we are dealing with a dangerous thing. I don't think it is our duty to tell patients that we will give them an anaesthetic that is entirely free from danger, and especially is this true when we give chloroform or ether. I am a physician as well as a dentist, and I have administered a great many times all the anaesthetics, and I have seen others who are far more expert than I am do the same, and I have seen patients die on the operating table under the most expert hands we have. I saw one man who had taken chloroform repeatedly without the least bad effect. He was placed on the table. His heart action was perfectly normal. His respiration was good. They gave him chloroform, and in five minutes he was a corpse. They used every method of restoration possible, and yet they could not bring the man back to life. There were certain conditions in the system of that man that could not be distinguished by the most expert physicians.

Another thing, when you give chloroform don't crowd it. If you need a physician to give chloroform or ether, which is not a bad plan if you wish to have the continued anaesthesia, don't let it be given rapidly. Don't crowd it at the start, because there is where the danger comes. In administering cocaine I think there should be some powerful stimulant combined with it. It is in these peculiar cases where the cocaine affects the heart suddenly that danger arises. Gentlemen, there are preparations we can use that are safe.

Dr. Geo. W. Cook (Chicago):

Dr. Brunson remarked about swabbing the tissues before the needle was put in. I think that perhaps I made a little error myself in regard to that point. What I meant, and I think what Dr. Bentley meant, was to say that that would not prevent infection altogether, that you could not expect that you would be absolutely free from danger of infection even after you had taken all those precautions. Those precautions are necessary, of course.

Dr. G. V. Black (Chicago):

I regard this matter of the relief of pain as a very important subject. Pain is never enjoyable. It is to be avoided as much as possible, and yet we must decide on a line where we should stop the effort to subdue pain by any of these medicinal agents. It seems to me that we owe a duty to the community which we serve in teaching the necessity for a certain healthful amount of endurance. The idea that people may avoid pain by this or that procedure seems to seize upon folks until they demand that which is not best.

I have been acquainted with anaesthetics and the giving of anaesthetics and the disposition of people toward anaesthetics for fifty years. In 1856 my brother, with whom I was studying medicine at the time, said to me, "We must do something to break this craze for chloroform," and he directed me to procure some cats and dogs. We experimented a little with them, and then asked some persons to see some experiments with them, and we killed them very quickly, showing plainly that we were handling drugs that were dangerous.

We may say that an anaesthetic is not dangerous, and I have often qualified that when speaking to my patients by saying: "No, it is not dangerous; neither is it dangerous to take a ride on a train, but some people get killed in taking rides on railroad trains." Qualified in that way, we may say that anaesthetics are not dangerous, but they are always dangerous. Furthermore, cases have come up over and over again with me personally where persons did everything in their power to conceal the danger to themselves, and this will occur in dentistry, perhaps, oftener than anywhere else.

It is not wise for us as conservators of the interests of the public to permit the use of an anaesthetic for every little pain that comes up, but rather we should inculcate in these communities the necessity that a certain amount of pain is to be borne. This will do much for the good of the community.

To the question, Who should give anaesthetics? I should answer, the man who knows how, no matter whether he is a dentist or a physician or a surgeon. There are some surgeons I have known—very good surgeons, too—who had no business to handle anaesthetics at all, because they were absolutely careless in the handling of them. A man may know ever so much about a thing and become so utterly careless as to be incapacitated from doing it properly. As to selecting the man who knows, we would not always select the man who has given anaesthetics the oftenest. It requires a close insight into general pathological conditions and danger signals. None of us like to give anaesthetics to very fat people. We don't like to give anaesthetics to persons whose nervous systems have received a great shock from disease or injury; and yet sometimes we must give them under very adverse conditions. The necessity should govern very much, not the whim or the disposition to avoid a little bit of pain.

The question of teaching anaesthetics in the schools has been raised. I think it is true that dental schools are doing more teaching of anaesthesia than the medical schools today. There was considerable inquiry made a short time ago, and the medical schools claimed to do so much and so much teaching of anaesthesia, but when we came to sift it down it was the mentioning of anaesthesia occasionally in teaching materia medica, and in this and in that, and there was really no fixed course of lectures on that subject, no fixed demonstrations for the purpose of teaching anesthesia. In clinics anesthesia was used, but the patients were generally brought into the room anesthetized and the students witnessed the operation under anesthesia. Gentlemen, I do not regard that as the teaching of anesthesia at all. When we undertake to teach anesthesia we are supposed to have a regular course of study of the questions involved, not only as to the anaesthetic itself, but of the pathological conditions which prohibit its use, the pathological conditions which might arise that render it dangerous, the danger signals that give warning, and all this class of subjects connected directly or remotely with the use of anesthetics.

Now it is true that dentists are giving anesthetics more than any other class of professional men, except the professional anesthetists. I am very glad indeed to find that this specialty of the professional anesthetist is coming to the front, and that men are being employed because they have studied this subject theoretically and practically; but I wish to emphasize again, Mr. President, before I sit down, that every professional man, every dentist, every physician and every surgeon as well, has a duty to perform in teaching men and women that it is their duty to themselves to bear a certain amount of pain, to put up with it because it is for their good. (Applause.)

DR. T. W. PRITCHETT (Whitehall) :

I wish to say that I think *confidence* is rather a good anesthetic—confidence and belief in the knowledge and skill of the operator.

As an instance of that I once had occasion to call upon the last speaker (Dr. G. V. Black) to do a little service for me involving the resetting of a crown where the gum had become embedded between the crown and the root. He informed me that the gum needed to be excised or shortened, or something done with it to get it out of the way; it would bleed, and that would make trouble. He proposed a plan which at first I did not consider favorably. He was going to anesthetize the part, and do it right, without hurting me. He began to heat a piece of steel of considerable size in a lamp, before my face, and said with that he would remove this obstruction very nicely, and he began heating it up, and I watched the operation of heating, and as it began to glow I had a feeling of apprehension, and I began to quiz him a little. I was a little bit skeptical. I was something of a doubting Thomas, and I asked him these questions: "Have you ever done this thing before?" and "How did they like it?" (Laughter.) He said to me in a way that was convincing that he had, and I consoled myself with the idea that he would not impose on a youth like me an untruth, and I said, "Go on with your heating," and he did heat it, and he put it on, and I was looking at him. He got it there, and it didn't hurt. (Laughter.)

Dr. Pruyn, in closing the discussion, said:

I thank you for the very cordial reception you have given my paper.

Dr. Haskins called attention to a case of death in Chicago, and as I am quite familiar with that case, I will state something about it. The dentist was a young man of limited experience, who called a physician into his office to administer the anesthetic. The dentist had nothing to do with it whatever. The physician examining the case administered the anesthetic, and the patient died. The case came up before the coroner's jury, who exonerated the physician and censured the dentist. He was a young man, no particular friend of mine, but as soon as I heard of it I went to his house. He told me the circumstances. I put my arm around him,and said: "My young brother, I am going to stand by you. I am going to have every dentist in Chicago stand by you. I am going to bring this matter up before the Odontographic Society and have it properly ventilated." It did that young man a world of good. He thought he would have to leave Chicago, as it would destroy his practice. I simply recite that to show how we can help our brothers in such an emergency as that.

Our brother, the young man who seems overconfident in the use of anesthetics, ought to be reminded that many of the deaths from chloroform and ether have come from those cases that seem to be the most promising. Don't take things for granted. Be careful, be careful, be careful.

To our friend, Dr. Bentley—he smiles now. I used the word "dangerous" regarding those headache preparations. I said that the coal tar headache preparations are doing very great harm, and are dangerous. I am sorry that subject has not been touched upon, because there is a field for us to exercise our judgment. The physicians of the land are recognizing the harm that is coming from the indiscriminate use of these coal tar preparations.

Dr. Arthur Black spoke about the normal salt solution for local anesthesia. I have produced local anesthesia with common warm water, without any salt even. The pressure of the water on the nerve filaments will oftentimes cause anesthesia. I have produced unconsciousness with ten drops of chloroform. Was it the chloroform? No. What was it? We all employ direct suggestion. I used the ten drops and said to the patient what I was going to do; that I was going to use very little of the drug, and that she was going to do what I told her, and the operation would be performed nicely.

Dr. Bentley:

What do you call that?

Dr. Pruyn:

I call it the law of love and kindness. I always failed unless I could get the complete confidence of the patient.

A few weeks since a gentleman in our building, another dentist, called me up hastily and said: "Dr. Pruyn, I have a case down here that I am afraid is a case of cocaine poisoning." I said: "What are you going to do?" He said: "I wish you would come down at once." I excused myself to my patient and went down at once to see him. The patient had come into the office from the hands of some cheap establishment. She said she had had two or three teeth extracted, and was all right when she left the office, but after she got out on the street she had symptoms of cocaine poisoning which were very noticeable. She went into the office of the dentist, who wasn't very familiar with the symptoms, and wanted help. I took the case at once, and injected morphine, and helped her out of it. She was some time recovering. We did not know it was cocaine poisoning, but the symptoms were so marked that the only thing to do was to go on the supposition that it was, and inject the antidote. We did it with satisfactory results.

This was a large, fleshy woman. It was about two o'clock. She had had no lunch. This injection had been made upon an empty stomach. I stated in my paper that cocaine should always be administered on a full stomach. One of the first symptoms is difficult breathing. Cocaine paralyzes the centers of respiration. Another is the peculiar apprehensiveness of danger. There was a condition approaching syncope and a fearful condition or apprehension of approaching death, as if she asked: "What can you do for me; I can't breathe; help me, help me!" That is the thought. You see this condition of things in the lower animals. When you give it to a dog you see the same symptoms. The poor dog will come and look up at you as though he were having trouble with his breathing. "Help me, help me to breathe!"

Some years ago I went into this subject very exhaustively, and if you will read the report of the twenty-fifth anniversary of the Chicago Dental Society you will find it more in detail than I can explain it now.

DISCUSSION OF DR. BLAIR'S PAPER.

Dr. E. L. Burroughs (Edwardsville):

Mr. President, Ladies and Gentlemen:

Our esteemed friend is, I am glad to see, quite aware of the possibilities and needs of well organized local societies, and this means good membership for the State Society.

When I face some of the gray-haired gentlemen of my calling, men who have devoted so much of their valuable time for the advancement of dental education and the upbuilding of dental societies, that you and I might enjoy these privileges who would not heretofore, then might we blush and hide our faces with shame and dishonor.

The local societies throughout the great State of Illinois need no introduction to you today. There are some of their members, however, I am very sorry to say, who simply pay their dues and scarcely ever put in their apearance.

Too large a percentage of the membership are willing to reap the benefits without any work on their part; too many of the members want good dental legislation, whereby their quack and unlawful competitors might be disposed of, but they lack the grit, industry and backbone of a man to take a turn at the wheel that these results might be accomplished. No organization can prosper without active support on the part of its membership, and you who are members after this lazy fashion are only deceiving yourselves and the community in which you live.

The essayist refers with surprise to himself that the energetic practitioner within easy traveling distance does not attend the Chicago Dental Societies. Now personally I do not altogether attribute this to a lack of energy, but a lack of knowing better and indifference. The test of local district societies throughout the State of Illinois has so far proven advantageous in that it brings together one thousand or more of the local practitioners at frequent intervals, and has increased threefold the membership in the State Society. The privilege of attendance upon such an organization as this, if for no other reason than the exchange of thoughts and ideas and the promotion of good fellowship, would more than repay us for being members of some local society.

We live and act in an age of organizations—social, fraternal, political and business—and correspondingly to the underlying principles which prompted their foundation they have moved onward, or else failure has been the result. Now, the two fundamental principles named by your essayist, upon which the local society has been founded, are the advancement of professional education and a closer bond of good fellowship, both of which are motives above reproach. This indifference which has been manifested by so many of our profession has been, in a measure, overcome by the local societies located in our own or neighbor town. That ever active sentiment of man for home pride and town prestige has prompted the laggard to bestir himself and become a member of the professional fold.

The printing press, as the essayist has said, has done wonders for the profession, but it alone will not suffice the needs of our people. If such were the case, why could we not say to the young man of twenty years seeking dental education, "Buy certain books, go to your room, study nine months for three consecutive years, and you will then be a dentist." Oh, no, my friends! Too many of us remember the difficulties and heartaches we encountered, though we had the shining lights of our profession to be our daily bodyguard. The disadvantages of non-membership, as referred to by our essayist, are twofold—first, that to the society, viz., a lack of union and strength; and second, to the dentist himself, who builds a strong wall about himself and sinks to oblivion, so far as the possibility of professional advancement is concerned.

Let us be co-workers, one with another, increasing our membership, gaining knowledge, and our patrons will reap a harvest of skill.

Dr. Arthur D. Black (Chicago):

Dr. Blair has told us that there has been a total attendance of from twenty-five hundred to three thousand dentists at the meetings of the local societies in this State during the past year, and we are to discuss the question whether or not these men have received enough of benefit that we can expect them to continue to come together.

Certainly there would not be that attendance, which equals the whole number of dentists in the State, unless there was something worth while. To my mind the local society is the heart and strength of the organization we have in this State. All strength we have now, and all we will have in the future, depends upon the local societies. Therefore it is very important for the members of this Society, as a State society, to know what the local societies are doing and what their chances are for the future.

There are three principal lines upon which local society work should be developed, and by far the most important of these three is the development of good fellowship. I believe it is more important than the other two, the professional advancement and the business side. I have had the pleasure of visiting a number of the local societies during the past year, more in the southern than in the northern part, and I wish that some of our older members who have not seen much of local society work could have attended some of the meetings held by the societies in the southern part of the State. I do not say anything against the meetings in the northern part of the State, but I have happened to attend more meetings in the southern part, where we have not had many members heretofore.

This Society in 1904 had but five or six members in the southern part of the State, where we now have about two hundred. These men hardly knew their neighbors in the next town. They have gotten acquainted and gotten together, and you may see them in the meetings in groups with their arms around each other, and they feel that they are friends of one another, where they did not have that feeling before. To my mind that development of good fellowship, which can only be accomplished by the small society, is the most important feature of the local society work, and necessarily of the whole organization scheme, because if there is not good fellowship in the local society there will be no success in anything it undertakes.

In regard to scientific value and professional development, I would say that the local society is the place where the individual man should be developed, and this will depend absolutely upon his activity. Every man must get into the game, and take some part in the work of his society, if he expects to get very much out of it. In the few meetings I have attended I have suggested the old Methodist plan of the chair calling on every member of the society to get up and say something. Maybe a man will not have much to say the first time, but if he gets up on his feet he breaks the ice, and it may result in great development of that man in the future. I do not think any of us who have stood up before a society and said something will forget the first time. I know I never will.

The specimen program that Dr. Blair gave is one of the poorest programs that he could have presented as representing the good to be gotten out of a local society. He gave us a program where a local society of twenty-five men were entertained by four clinics and three papers, all by men from far outside of their district. There was not a thing done at that meeting by a member of the local society, except some discussion of the papers and watching the clinics. That is not development, to my mind. Those men may have gotten some good out of that meeting, but they did not get as much good as they would if they had had one man from outside and the rest of the program furnished by their own members. The local societies which will succeed are those which require their own men to do a good portion of the work, and do not require members of other societies to come in.

In the president's address at the meeting of the Iowa State Dental Society, a year ago, it was suggested that that society, which has, I think, about two hundred members, should be divided into a number of what they call "study clubs," each consisting of men interested in some branch of dentistry. The members of each club get together several times during the year and work along some particular line. That has been done during the past year, and I am told by one of our members who was at the Iowa meeting last week that they are very much pleased with the work of these study clubs. I only mention this as a suggestion to our local societies.

There is a very decided business side to the local society, a side which can not be considered by a state society. We have in each local society men who are working under similar conditions. The education of the public in the territory of any one local society is somewhat the same. The people are accustomed to paying about so much for a certain dental operation. In some other section they may be used to paying more than that. Therefore, the local societies may do much by working harmoniously along business lines. There are many points that can be considered, and not the least among these is the matter of prices. There is no doubt in my mind that the dental profession in this State, and everywhere, is getting not more than half of what it ought for the service rendered, and the local dental society can remedy this. There are sections in this State where the same operation costs three times as much as it does in other sections. In the one case the men have gotten together and educated the public to pay a fair price for the operation, and in the other case they have not educated the public. I do not mean that the local society should take advantage of the public by an increase of the fees, but if the fees are too small the local society should be the means of educating the public to pay the fee that they ought to pay. There is no doubt but that as the fees are advanced the public will be the greater gainers, for they will get better service. The dentist who is getting a good fee feels that he can take plenty of time to do a good operation, whereas if he is getting a small fee he is not as apt to give perfect service. If he is getting only $7.50 for a crown, and the contact, for example, is not perfectly right, he can not afford to take the time to make it right. We might, from the higher moral ground say we ought to make these operations right, no matter what the fee is, but it won't work out practically. If a man does not get a good fee, he is apt to slight his work.

There is one other thing that I think the local societies ought to do, and that is to follow the example of the Will-Grundy County Society in the appointment of what they call, I think, a legislative committee to see that men who are practicing in that locality are regular practitioners. If they are not, it is the duty of this committee to get the information to the State Board of Dental Examiners, so that such men can be prosecuted. The local dental societies can clean up this State of the scallawags that are practicing dentistry without licenses. If this matter is taken up by our local societies, we can, within one year, have the cleanest lot of practitioners in Illinois that there is in any state of the Union. (Applause.)

Dr. J. N. Crouse (Chicago):

I have been very much interested in hearing Dr. Blair's paper and in hearing the discussion. It occurred to me while they were talking that interest could be created in these societies by having each member bring in at the meeting incidents of office practice, and thus open the way to get men down to study. Here and there you would find a man spring up who would want to do something of credit to the Society. Human nature is all alike, and what we need is men to get down and study. I am a past-master in society work, and used to study out ways in which we might interest the members, and the way dentists have been interested in this study is very encouraging. We must keep on until we get all the men in who ought to be got in. There are always a few that never will be any good. Don't get them into your society. They will be a detriment. We have had that experience in our society in Chicago. There is always a set of fellows you never can make over, and when you are sure of that drop them, if you can. I hope these local societies will keep on increasing their membership, and I will be glad to give them any help I can. (Applause.)

Dr. Torrence (Chester):

My only apology for appearing before the State Society is a remark or two made by Dr. Arthur Black. He met with us in East St. Louis about a month ago, and gave us what I call a great deal of taffy. I had no idea he would have the cheek to come up here and say the same thing before this Society, and I want to apologize to him and tell him that I misjudged him. I think now he was in earnest about it.

Speaking about the different methods of getting men to attend the society meetings reminds me of a story I heard not very long ago. Perhaps some of you have heard it. It was either the St. Louis Dental Society or the Missouri State Dental Society, I forget which, which was having trouble to get the members out. Dr. Conrad, of St. Louis, said if they would let him select the subject for a paper he would guarantee a good meeting. The subject he selected was, "How to Get Broken Nerve Brooches Out of the Roots of Teeth." They were all there. (Laughter.)

As far as our local society is concerned, we have had now, I believe, three meetings since the reorganization. At the first meeting we had four or five, and at the second meeting three. The next meeting was in East St. Louis, when Dr. Black was present, and I think we had forty-two. You see we are growing. Another thing, in looking over this Society I notice quite a number of faces from my part of the State. That has been the result of the reorganization. We of southern Illinois felt that you gentlemen were too far away from us, but we have gotten over that. While it is a fact that I see lots and lots of southern Illinois men in this audience today, six or eight years ago I attended a meeting in this city and did not meet a face I knew except Dr. Rohland and Dr. Pritchett and Dr. McMillan. (Applause.)

Dr. Dittmar (Chicago):

I want to elaborate some ideas Dr. Black advanced concerning the social part of the work. I know of nothing that will do more to create good fellowship in a local society than having a picnic together. That is a custom with the northern societies to a certain extent. They get together about once a year, during the summer months, and go with their wives and friends to a picnic. If anything will promote good fellowship it is that one thing. I have attended several such that were very successful. Don't talk shop all the time, but find out what the other fellow is, and let him find out what you are. You will think a great deal more of one another.

Another thing that I would like to mention is programs. I find that in some of the more newly organized societies the program committee does not select the right man for the right subject. They get a man on orthodontia, for instnace, that probably has never done anything on that line. If they were a little more careful they would probably get better results. I have noticed this in one or two meetings I have been in, and I also think that they should give a man that they expect to take up a certain subject more time—notify him several months in advance.

Another thing is prices. I know enough about the prices a country dentist gets to know that he works hard for very little money comparatively, and if anything will help that condition it is this reorganization. There is too much done by the dentist that he does not get proper pay for. In certain districts dentists will clean teeth for seventy-five cents or a dollar, put in cement fillings for fifty cents, amalgam fillings for seventy-five cents, and things of that kind. He will probably treat an alveolar abscess and fill the tooth for $1.50 or $2. Fees of that kind are absolutely too small to consider, and it is useless for a good dentist to spend his time that way. You can improve that condition, I am satisfied, if you organize properly, and get together, so that the fees will be fair to you and fair to your patients.

Dr. G. W. Cook (Chicago):

I fully agree with Dr. Black that a man never accomplishes anything unless he gets to work and does it. If a local society is worth anything, and is going to accomplish anything, it will do it by giving somebody work to do, and letting them do it. As Dr. Crouse has just stated, human nature is such that men have some pride in what they do, and if they do it poorly one time, the next time they wil do it a little better, and after a while we will pay them a little fee to come to Chicago and read a paper to us. (Laughter.)

I appreciate how hard it may be to organize these local societies, and how hard it is to get the men interested in them, and I hope when they get the country well organized that there will be some local societies organized in Chicago, so that the young men will have a chance to get into society work, and do something up there. (Applause.)

Dr. Blair (closing the discussion):

On no less than three different occasions during the paper I think you will discover that I gave positive emphasis to the fact that individual effort in society work is by far the most profitable to the members. I also laid stress upon the fact that social fellowship experienced in attending these meetings is very hepful.

I do consider that a program where clinics are given by members of the profession, and not members of the local society, is a good program, and I want to say right now that my observation throughout the central district of Illinois for twenty or twenty-five years leads me to the conclusion that if you want to bring the members of local societies together it is a good thing to have a mixture of local and foreign talent on the program. Let them do what they can locally, and then bring some strong specialists from the outside to give new light, and show how the work is done elsewhere. The combination of these two forces is to me the most practical way to develop interest in society work. I do not think that we should put too much stress upon asking every one to take part in every single discussion, because many of them are not in condition to do it. I can not, and a good many men who are much brighter than I am can not discuss every paper that comes up. It adds interest to the meeting if you bring from outside such men as Dr. Black or others that I might mention in Chicago and elsewhere. I have gained many good ideas from them, and I expect to continue to do so. I am sorry that I can not give them something in return.

The business side of the matter is an important one. I did not mention it in the paper because that paper belongs in the transactions, but I wish there were 500 dentists here tonight to discuss the question of prices, so that we might have a better understanding. You have no conception of the work done absolutely without charge by many dental practitioners. It is not the fault of the patients. It is the fault of the men of the profession alone who do not appreciate that when we are rendering competent service we are entitled to fair remuneration. It is education along this line that will put us in a position where we can sit together better as neighbors, and when we reach the evening of life there will be something laid by to make a man comfortable in his old age. Members of our profession ought to know that competent service honestly rendered is worth a fair remuneration.

RECENT PATENTS OF INTEREST TO DENTISTS.

818,661. Crown and bridge work. Arthur H. Brown, Hamilton, Mo.
819,001. Package roll of metallic leaf. Walter H. Coe, Providence, R. I.
818,940. Saliva ejector. Henry S. Davis, San Francisco, Cal.
819,641. Dental plate machine. William S. Filley, Montpelier, Ohio.
819,136. Tooth spreader. John E. Herman, Sandusky, Ohio.
819,137. Dental matrix retainer. John E. Herman, Sandusky, Ohio.
819,249. Dental filling. Frederick C. C. T. A. Osius, Muskegon, Mich.
819,678. Dental waste cotton receptacle. Bert C. Simmons, New Brunswick, N. J.
820,045. Dental vulcanizer. Valentine A. Cudex, Milwaukee, Wis.
820,025. Electric dental furnace. Daniel G. Steinecke, New York.
820,474. Mandrel for dental engines. William C. K. Buchanan, Kansas City, Mo.
820,781. Suspended electric dental motor. John F. Hammond, Brewster, N. Y.
820,717. Gold leaf book. Robert Henke Jr., New York, N. Y.
821,150. Dental swaging apparatus. Frank L. Argall, San Jose, Cal.
821,192. Set of artificial teeth. Carl Rauhe, Dusseldorf, Germany.
822,582. Attachment for natural teeth and forming the same. John P. Carmichael, Milwaukee, Wis.
823,150. Dental handpiece. Charles L. Alexander, Charlotte, N. C.
823,167. Dental disk shield. Wm. F. Green, Modesto, Cal.
38,079. Design, dental cabinet. Wm. G. Hullhorst, Toledo, Ohio.

Copies of above patents may be obtained for ten cents each by addressing John A. Saul, solicitor of patents, Fendall building, Washington, D. C.

THE DENTAL REVIEW.

Devoted to the Advancement of Dental Science.

PUBLISHED MONTHLY.

EDITOR: C. N. JOHNSON, M. A., L. D. S., D. D. S.

Subscription price $1.00 a year including postage, to all parts of the United States and its possessions, Cuba, Canada and Mexico. All other countries $1.75 a year.

EDITORIAL.

A BARE-FACED MISREPRESENTATION.

Something of a tempest has been started in Australian dental circles over the question as to whether or not a graduate of the dental department of Sydney University may use the title of "Dr." before his name. This institution gives the degree of Bachelor of Dental Surgery instead of Doctor of Dental Surgery, and when the first class of graduates recently went out, and began using the title of "Dr." one of their number was summarily brought before the dental board on a charge of "infamous conduct." The case caused much feeling if we are to judge by the attention given it in the public press in the way of editorial comment and correspondence. After a somewhat lengthy trial the board decided as follows:

> "The President, in announcing the judgment, said that the board had come to the conclusion that the conduct of Mr. Bradley in assuming the title of doctor, he having only attained the degree of bachelor of dental surgery, was such as the board condemned. Such conduct, however, appeared to have been based upon a supposed claim or right to establish a practice similar to that which obtained in the medical profession. Under the circumstances the board would take no action in the case. The board, however, reserved to itself full liberty of action if, in view of the opinion now expressed, the practice was persisted in by Mr. Bradley or any registered dentist in this State."

As a consequence, the graduates have concluded not to use the title of "Dr."

But what we wish to write about particularly, and what suggested the heading of this editorial is a statement in the *Sydney Daily Telegraph* of June 6, 1906, by a correspondent who signs himself "An Observant Globe-Trotter." In the course of his remarks he says:

> "The palm is unjustly awarded to the American degree holder. The amount of study required before one can take the. B. D. S. degree of the Sydney University is no mere child's play to the average student, and the standard of requisite knowledge is high, but in the United States things are different. Ignoring altogether the hundred and one bogus schools and small seminaries, let us take the big recognized schools, or, as they term them, "colleges," in America. Philadelphia and Chicago, for instance, from whence most of our "doctors" of dentistry have graduated, 75 per cent of marks are required to pass for the degree, made up as follows: Twenty-five per cent for attending lectures, which any idiot could do; 25 per cent for work in the class, and poor, indeed, must be the work that would not obtain that low percentage; and 25 per cent for answering questions, to prepare the student for which a cram book on every subject, with questions and answers, is supplied by the college for his special use."

If ever there was a more unwarranted misstatement of fact than this—even in the heat of the dirtiest political campaign where misstatements are supposed to be the common order of the day—we have not yet seen it. Written by an individual who claims to be observant it is unpardonable.

The reputable dental schools of this country need no defense against such attacks as this, and yet it may be of interest to some in the profession to know the exact requirements made of students for graduation in at least some of the institutions which this writer designates.

The attendance at lectures must be at least 80 per cent of the entire number given during the course, anything below this being a disqualification for graduation. The grade of the practical work in the infirmary must be 80, and this is most carefuly scrutinized and passed upon. The amount of practical work necessary for graduation is very extensive. For instance, in the operative department, a certain number of "credits" or "points" must be obtained, the minimum being 350. A gold filling, if the grade is satisfactory, will count from about 3 to 8 credits, according to the size and the difficulty of its insertion. An amalgam filling will count from 1 to 3. No credits are given for cement or gutta percha fillings, as they are used mostly in college for preparatory work. Inlays are credited slightly higher than fillings where the grade is good, but in no instance is a higher mark than 10 given for any one operation, and this is exceedingly rare. The amount of practical work necessary to make up the minimum requirements will thus be seen to be considerable.

In the written examinations there are at least two or three subjects in which, if the candidate falls below 75, he is rejected; and the lowest requirement in any subject is 60.

These are actual facts. How well they tally with the statement made by "An Observant Globe-Trotter" will prove interesting by comparison.

It is quite high time that the slurring of reputable institutions be stopped. There has been sinning enough on the part of bogus concerns in this country to call down just condemnation, but those colleges in which honest effort is being expended should not be made to suffer always and forever for the misdeeds of others.

PRACTICAL HINTS DEPARTMENT.

Edited By G. W. Johnson, D. D. S.

[This department is for busy readers. We want short articles containing practical ideas—the shorter the better. No article must exceed 200 words, unless of exceptional merit. Every dentist has some useful hint that has been of value to him, and if he will only put it in print it may be of equal value to others. That is what this department is for. Due credit will be given for every article sent. Address G. W. Johnson, The Dental Review, 55 State street, Chicago, Ill.]

Filling Material for Temporary Teeth:—I believe there is nothing that will work as well as a filling material in temporary teeth as the plate gutta percha, especially in proximal cavities. It works as a twofold blessing, closing the cavity and procuring space, different materials being indicated in different cases, however.—*R. M. Pearce, Rock Island, Ill.*

Method of Setting Logan Crown:—Prepare the root in the usual manner, and grind the crown to an approximate fit. Mix a small amount of Ascher's Artificial Enamel and place on the base of the crown. Slip over the pin a disk of very thin aluminum or tinfoil and force the crown to place. Remove and lay aside till the "enamel" thoroughly hardens, and with suitable disks, well oiled with vaseline, trim to the line on the foil indicating the periphery of the root. Remove the foil and set in the usual manner. This gives as near a perfect fit as can be made.—*Mark Hayter, Dallas, Oregon.*

Selecting Teeth for Dentures:—I have two classes of individuals for whom I select colors—the brunette and the blonde. The brunette always has a blue-white tooth, and the blonde a yellow-white tooth—extremely so. You can confirm this with your shade guides when these types of individuals appear in your office. In patients who are neither brunettes nor blondes you will find that one type or the other is predominating, and you can grade the shades according to the predominating type.—*E. J. Perry, Chicago.*

Application of Silver Nitrate:—Silver nitrate should be employed with a great deal of care. We should not use it in very deep cavities where there is danger of irritation of the pulp. It is in the beginning of decay of the teeth that it is especially useful. I crush a crystal of silver nitrate on the glass slide we use for cement and put a drop of water on it; stir it for a moment, then touch the end of a toothpick to it and carry it to the cavity with that, having first dried the cavity. Let this application dry, if possible, in the sun, and within fifteen minutes the silver will be precipitated and it will become black; if not so at the first sitting, repeat it from time to time until you get a thoroughly black surface.—*G. V. Black, Chicago.*

Artificial Dentures:—It is impossible to make artificial dentures in all respects typical of the human organs, because we are dealing with a condition of things in an edentulous jaw, where it is impossible to arrange the artificial teeth like the natural ones. The closure of the teeth is all important. The primary use of an artificial denture is mastication. Very often a patient has only the lower anterior teeth, and say they do not want a lower plate. I frequently say to such a patient that he or she may just as well undertake to run a coach with three wheels as to wear an upper artificial denture, with nothing on the lower jaw but the anterior teeth, for they can not masticate with the anterior teeth, but must wear a lower partial denture.—*L. P. Haskell, Chicago.*

Higher Education of Dentists:—Better education is being demanded in all walks of life, why not in ours? As we elevate ourselves, so will the laity elevate us. If it is true, as some think, that the public do not demand anything better than they are getting, it is the fault of the profession and not the public. Our title signifies our ability to teach, and if the public are not aware of what our position and title gives us, let us qualify ourselves to educate the public to the degree that they may know to whom to go in their hour of trouble. There is no such thing as belonging to a profession that will stand still. We must either go upward and onward with the world or be left behind.—*J. W. Penberthy, Minneapolis, Minn.*

Colored Arsenic Mixture:—Dr. Black long ago suggested that we should mix our arsenic with sufficient lampblack so that when placed within the tooth we could see plainly exactly where it lay, and detect any particles that might be disposed to crawl out of the cavity, also upon removal we could be sure of completeness. Anyone who will take the trouble to put up, or order from the druggist, a mixture of arsenic, morphine and cocaine, with lampblack sufficient to make a dull black, and will use this mixture for a time would never think of doing without it.—*Garrett Newkirk, Pasadena, Cal.*

Dental Art:—In regard to the ideal face, I can not conceive how it is possible to agree upon one of a fixed type, since the ideal of each individual differs from that of another. No two human beings are exactly alike. The color of the hair, the eyes, the teeth, the general form of the face or the complexion differs in some respects from every other individual, but if we have studied art from the artist's point of view sufficiently, and have assimilated what we have studied, we will be able to recognize the form and color of teeth appropriate to each individual case that comes to us, and to restore lost contour in such manner that the result will be harmonious.—*J. H. Prothero, Chicago.*

Treatment of Erupting Teeth:—I am convinced that most of the earache in children is due to the irritation of the erupting teeth, and at the same time suggest the use of antikamnia as a panacea, and also the use of the lance in cases of convulsions where it is indicated, as I believe we are justified in using it when teeth do not show at the proper time. Even if it does not afford permanent relief, it does no harm, because, supposing the gum heals and a cicatrix forms, it being of the lower form of tissue is more easily broken down by advancing teeth. Having seen many cases where the lance has been beneficial, I firmly believe in its intelligent use. In at least one case to which I was called the child was on the verge of convulsions, rolling the head and eyes, and in a state of evident stupor. The free use of the lance acted like magic, and in less than half an hour the little patient was enjoying a sound and natural sleep, the first in two or three days.—*W. A. Robertson, Crookston, Minn.*

Early Correction of Permanent Teeth:—In regard to the early correction of permanent teeth during the period of secondary dentition, it should be remembered that frequently nature in crowding the teeth into mal-alignments, so common with the lower incisors, is performing the same physiological function as before eruption in bringing full, adult sized teeth into small, ungrown jaws; and, therefore, with some exceptions, they should not be disturbed by any treatment which contemplates an extensive lateral expansion of deciduous arches which are proportionately normal in size. Though if any of the deciduous teeth are prematurely lost through injudicious extraction or otherwise, the permanent teeth should not be allowed to encroach upon the spaces and thus prevent the proper eruption of their successors.

If this has occurred with the molars, the first permanent molars should be restored to their normal occlusal relation and retained until the eruption of the bicuspids.—*C. S. Case, Chicago.*

Treatment of Children in the Office:—I encourage parents to bring their children to the office, from four years and upward. I get acquainted with the little fellows, ask them if they have teeth, too, and how many, inviting the mother to take the chair with the little one on her lap, let them see the mouth mirror, ask them to look in it; then I take the pliers with a pellet of cotton and pass over the teeth, give him a little box or bottle, invite him to come again, and have made a start that will win to myself a well-behaved patient.

In filling the teeth of children I employ any material I can best adapt in a rapid way. Oxyphosphate of copper is my pet. Gutta percha is almost as difficult to introduce as gold, unless the cavity can be thoroughly dried. It pays to treat abscess conditions in children's teeth. I am using with good results a combination of a 50 per cent solution of tricresol and 40 per cent solution of formaldehyde, equal parts. This may be sealed in at almost any stage of putrescence.—*F. H. McIntosh, Bloomington, Ill.*

Alveolar Abscess:—In the treatment of an alveolar abscess we have the same septic conditions that we have in the abdominal cavity or other parts of the body, consequently surgical treatment is necessary. The pathological condition is caused by bacteria and the most frequent is the staphylococcus pyogenes aureus, and I have had cases where the microscope has demonstrated the bacillus gingivae pyogenes (Miller). It will therefore be seen that surgical treatment is necessary.

When a case is presented for treatment the symptoms are fever or chills, and this shows that pus is forming or is in a localized area. The tooth is sensitive to percussion, or elongated, and there is a gnawing pain caused by the pus pressing on the nerves.

The treatment is to lance at once by making a large incision, and irrigate with a 1 per cent lysol solution or some bland antiseptic. The incision is then packed with borated or iodoform gauze, or you can use sterile gauze with compound tincture of benzoin. This will usually give immediate relief, after which I drill into the tooth and clean out root canal with alcohol, and then use a solution of tricresol, creosote and formalin. Two or three treatments is usually sufficient to prepare the tooth for root filling.—*Chas. E. Abstein, Chicago.*

MEMORANDA.

TEXAS STATE DENTAL ASSOCIATION.

The Texas State Dental Association held a most successful meeting at Galveston June 14, 15 and 16, with one hundred and fifty members present.

Very truly, G. W. STAPLES, *Secretary.*

UNIVERSITY OF MICHIGAN COLLEGE OF DENTAL SURGERY.

GRADUATES OF 1906.

F. A. Benedict, C. C. Davis, W. M. Dow, F. E. Dunster, A. B., A. J. Hall, H. H. Harper, J. S. Hawley, C. P. Hendricks, W. G. Kinyon, J. D. Lafayette,

M. D. Mackoy, Ph. G., C. F. Miller, A. E. Ramsdell, C. J. Reilly, C. W. Ringler, C. V. Smith, T. R. Southard, E. C. Stanton, L. E. Stiles, J. H. Taylor, R. H. Vollmayer.

THE COLORADO STATE DENTAL ASSOCIATION.

The twentieth anniversary meeting of the association was held in Denver, at the Brown Palace Hotel, on June 19, 20 and 21. The meeting was a notable one, the essays and clinics being of unusual interest. A large attendance and keen interest was had throughout the sessions. Colorado Springs was chosen as the next meeting place.

Newly elected officers are as follows: President, Dr. J. Allen Smith, Colorado Springs; vice-president, Dr. G. A. Dille, Denver; secretary, Dr. B. Frank Gray, Colorado Springs; treasurer, Dr. Wm. Smedley, Denver.

THE MISSOURI STATE DENTAL ASSOCIATION.

The forty-first annual meeting was held June 5-6-7 at Springfield, Mo. An important feature of the meeting was the adoption of a plan for organizing district societies throughout the state. The following officers were elected: President, F. G. Worthley, Kansas City; first vice-president, J. W. Hull, Kansas City; second vice-president, J. B. McBride, Springfield; recording secretary, H. H. Sullivan, Kansas City; corresponding secretary, E. P. Dameron, St. Louis; treasurer, J. T. Fry, Moberly.

The forty-second meeting will be held in Kansas City.

E. P. Dameron, *Corresponding Secretary.*

THE MISSISSIPPI DENTAL ASSOCIATION.

The thirteenth annual meeting of the Mississippi Dental Association closed Friday, June 8, 1906, the most successful meeting in the history of the association. Gulfport proved to be a most enjoyable place for the meeting.

The following officers were elected for the next year: President, Dr. L. B. McLaurin, Natchez; first vice-president, Dr. L. A. Smith, Port Gibson; second vice-president, Dr. J. E. Phillips, Meridian; secretary, Dr. E. Douglas Hood, Tupelo; corresponding secretary, Dr. W. H. Reaben, McComb City; treasurer, Dr. C. C. Crowder, Kosciusko.

The association will go to Meridian next year and will meet during the month of May. Great plans were suggested at the meeting whereby the Meridian meeting can be made still better and it is the intention of the officers to try to eclipse anything ever before offered by any Southern State.

For information at any time, address the secretary.

E. Douglas Hood,
Tuepelo, Miss.

RESOLUTION.

Whereas, The hand of Providence has removed from us our honored member and active co-worker, Dr. Charles C. Chittenden, and

Whereas, In his decease we have suffered the loss of a member who had an active interest in this society and who had the welfare of the entire profession at heart, therefore be it

Resolved, That we, the members of the Southern Wisconsin Dental Association, in annual session in Milwaukee, this 31st day of May, 1906, express to the members of his bereaved family our sympathy and sorrow in their affliction and assure them of our admiration for his high personal and professional qualities, and

Resolved, That these resolutions be spread upon the records of this association, a copy sent to the family of our departed member and copies sent to the dental journals for publication.

E. J. Hart,
P. B. Wright,
Chas. L. Babcock, *Committee.*

FIRST ANNUAL REPORT ROCHESTER FREE DENTAL DISPENSARY.

On Washington's Birthday, February 22, 1905, the Rochester Dental Society, under the auspices of the Rochester Public Health Association, opened a free dental dispensary at 32 South Washington street, for the care of the teeth of the worthy poor.

Equipment and materials valued at $1,200 were installed; one-half of this amount was donated in cash by a member of the Rochester Public Health Association and one-half by members of the Dental Society, city merchants and dental manufacturers and dealers throughout the world.

During the first year twenty-four members of the society alternated in attendance at the dispensary.

January 15, 1906, an operating staff of three dentists were appointed, one of whom is in attendance from 2 to 5 p. m. each week day.

Report of operations to March 1, 1906, are as follows.

Patients treated	203
Separate visits made	478
Operations performed	1,078

F. W. Proseus, *Chairman,*
Wm. W. Belcher,
B. S. Hert,
W. W. Smith,
L. H. Gilbert, *Committee.*

NATIONAL DENTAL ASSOCIATION.

The tenth annual session of the National Dental Association will be held in Atlanta, Georgia, commencing Tuesday, September 18, 1906.

The New Kimball House has been selected by the local committee of arrangements as headquarters, where all general sessions of the association and of the sections will be held. The rates per day at the New Kimball House will be, European plan, from $1.50 to $4.00; American plan, $3.00 to $6.00, governed by choice of rooms.

The usual railroad rate of one and one-third fare for the round trip, certificate plan, will be arranged for, and definite dates and particulars given later by Dr. J. D. Patterson, chairman of the executive committee.

The general officers and those of the sections, as well as the committee chairmen and their members, have been working hard to provide an interesting and instructive program, and a large attendance is expected.

SECTION 1.

Section 1 presents the following program of papers for consideration:

"The Present Status of Porcelain Inlays"	John Quincy Byram, Indianapolis.
"Orthodontia"	Richard Summa, St. Louis.
"A Phase of Art in Prosthesis"	George H. Wilson, Cleveland.
"Porcelain"	C. N. Thompson, Chicago.
"Setting Crowns and Bridges with Gutta Percha"	L. G. Noel, Nashville, Tenn.
"Orthodontia"	Victor H. Jackson, New York.
"Orthodontia"	Calvin S. Case, Chicago

"The Inevitable Outcome of Crown and Bridge Work"..............
..................................Parmly Brown, New York City.
"General Practice"...................W. Leon Ellerbrook, Salt Lake City.

B. L. Thorpe, *Chairman,*
St. Louis, Mo.

D. O. M. LeCron, *Secretary,*
St. Louis, Mo.

SECTION 2.

Section 2 presents the following program of papers for consideration:
"Manual Training an Essential to Dental Education"..................
......................................Burton Lee Thorpe, St. Louis.
Subject not given...........................Geo. S. Vann, Gadsden, Ala.
Subject not given......................Clarence J. Grieves, Baltimore, Md.
"Prosthetic Nomenclature"....................Geo. H. Wilson, Cleveland.
"The Nomenclature of Materia Medica and Therapeutics"............
....A. H. Peck, Chicago.
"Operative Dentistry"........................H. H. Johnson, Macon, Ga.

Howard E. Roberts, *Chairman,*
Philadelphia, Pa.

C. S. Butler, *Secretary,*
Buffalo, N. Y.

In one of the general sessions, Charles McManus, Hartford, Conn., chairman committee on history, will present an illustrated paper on "The Remarkable History of the Profession, and the Splendid Character of the Men of the Past Who Helped to Build It Up." A. W. Harlan, New York City, will present a paper on "The Blue Light and Heat as Therapeutic Agents."

The committee on oral hygiene promise an interesting summary of their work, illustrated methods of teaching the science to both dentists and laymen, essays, resolutions and the report of the committee.

J. P. Corley, *Chairman,*
Greensboro, Ala.

F. W. Stiff, *Secretary,*
Richmond, Va.

We are promised a large and interesting list of clinics, and they will be held in one of the dental college buildings. Announcement of the list and where they will be given will appear later.

Thomas P. Hinman, *Chairman,*
Atlanta, Ga.

C. L. Alexander, *Secretary,*
Charlotte, N. C.

It is the earnest desire that there shall be a large attendance of members and delegates, so that the committee to devise ways and means to own and control a dental journal may feel encouraged to launch such a scheme as will at once meet approval and hearty support, and the association has members enough to guarantee the project.

Many other features for a new era of success in the National Dental Association can be mapped out at the Atlanta meeting if only we have a sufficiently large and enthusiastic gathering of the members of the profession to make it appear worth while.

M. F. Finley, *President.*
Washington, D. C.

THE

DENTAL REVIEW.

VOL. XX. CHICAGO, SEPTEMBER, 1906. No. 9.

THE DUTIES AND OBLIGATIONS OF THE MEMBERS OF STATE BOARDS OF DENTAL EXAMINERS.

BY DR. C. R. TAYLOR, OF STREATOR, ILL.

The duties of each member of every state board are laid down by the constitution and statutes of the several states having such a political organization as a State Board of Dental Examiners. As the laws governing such bodies are written, they are usually easily understood and readily interpreted, but inside and outside of the letter of the law lies the spirit and obligations belonging to all the interests involved.

The execution and enforcement of such laws become a matter of fundamental importance. For often good laws are selfishly executed and made to further special interests. When such is the case the object for which the laws are intended is lost sight of, and the laws become a means of oppression and tyranny. Any law that is simply made to minister to selfish interests or special purposes is wrong, whether those purposes are for a person, profession or institution. No law is worthy to be called a law that is not fundamentally and essentially intended for the benefit of the great mass of the people, and not for the purpose of fostering some particular interest, whether the interest be for a profession or otherwise.

Laws framed and executed in the interest of the people will finally be proven to be the best for those special interests that really ought to exist. Any person, institution or profession worthy to continue is finally injured if it depends upon unjust and special legislation for its promotion and advancement. Our purpose as a profession should never be to ask for laws or their enforcement simply to

---

*Read before the Illinois State Dental Society, May, 1906.

benefit the profession as a whole or for its individual members. But our purpose should be to seek for such laws as have the best interests and protection of the people at heart, and the profession as a whole will finally be best served under such administration of law. Life at its best is made up of labor, love, service and sacrifice and under the benign law of compensation, a profession or individual gathers to itself what it gives to others. So that profession is best that promotes most completely the best interest of society. And a state board is at its best when its aim and object is to enforce the law justly and impartially so as to conserve the highest interest of all.

The duties of dental examining boards should be largely confined to the protection of the people from unworthy, incapable and illegal practitioners, and to see that only well qualified persons are allowed to enter the dental profession, by actually practicing the art and science of dentistry.

The power to manage and control dental institutions of learning should not be given to dental examiners. That authority should rest with the educational department of the state, which should have supervision over all scholastic education in the state. Until that condition is attained it will be necessary for state boards to establish and maintain the reputableness of dental schools by seeing that the curricula of such schools are sufficiently high and well sustained to meet the requirements of the best interests of the people in dental education. The most that should be expected of state boards of dental examiners regarding education is the examination of the product that comes out of the dental schools, when the product seeks to practice upon the people what it may have learned in such schools. The fact is, the duties of examining boards should not require them, only incidentally, to ask the applicants as to how, when or where they acquired the knowledge, skill and wisdom necessary to perform the duties and obligations required of practitioners of dentistry.

The law and the examiners should be satisfied in *knowing* that the person seeking to practice dentistry has the skill, knowledge and wisdom necessary to give the people the best services required at the hands of a licentiate. Time will prove that it is not only a mistake in the laws allowing boards to direct or control dental schools, but just as equally a mistake for such institutions of learning to manage the state dental boards by seeking to dictate the appointment of members on the boards, or to direct them after their appointment.

We all realize that our best dental colleges are vastly superior to the schools of a few years ago, and yet we also know that no dental school is known where a full, complete and practical dental education can be obtained. And our laws are not for the best interest of the people and the profession or the individual student when it denies to any person the right to gain information and skill from any proper and useful source.

It may be said in passing that the ideal educational condition will not be obtained until the question of what it costs to secure the necessary education to meet the requirements of society is eliminated. Every community should provide its social servants with the very best education needed for them to supply the community with the best service.

When that condition of affairs does exist men will be selected because of capacity and ability to minister most successfully and acceptably to the needs and wants of the individual and the community. Of course that means that not only must all schools be under the supervision of the state, but that all the schools for special or higher education must either be endowed or fostered by the state. In that way whatever education the individual needs to meet the requirements of society he will obtain without the price of tuition being the determining factor.

Then the question of qualification will not be determined by personal sympathy or financial interest of the instructor, but determined by the information and capacity of the individual to pass the required preliminary and final examinations. It seems as though such conditions should hold, particularly, with practitioners of medicine and dentistry.

The facts are today that a larger per cent of the graduates of our higher schools of learning, yea, of our professional schools, could not and would not pass the preliminary and final examinations and secure their diplomas, were the financial and personal factors eliminated.

The owners and instructors of our dental schools are not the only ones affected by our present educational methods and conditions; for State boards are influenced and too much controlled by these same conditions. The experience of the different State boards shows that a large per cent of the graduates of our dental schools can not successfully pass the memory test even when they are just from college. Examinations should be so conducted by the examining boards as to not only prove and test the memory knowledge, but to demonstrate the ability of the person seeking a license that he has the wisdom necessary, and can actually apply his knowledge, and can prove it by clinical demonstration.

The Illinois State Board of Dental Examiners are endeavoring to carry on just such examinations in all the various branches of dentistry, both theoretical and practical. Each person seeking to practice dentistry is supposed to have a good moral character as required by law, and before a license is granted, is examined as to intellectual endowments and acquisitions. It would seem as though the question of physical perfection should be a matter of enough importance for the law and the State Boards to take cognizance of, for there are a number of persons so defective in sight and hearing as to actually handicap them from making their profession a personal success, besides letting the public bear the consequences of their defectiveness. Many also suffer from epilepsy, periodic insanity, and drug habituations, disqualifying them from rendering the services necessary to satisfy the best interests of their patrons.

Before a man can enter the medical or dental corps of the army he must meet and pass a physical examination. Is there any reason why the people should not be protected from the physical as well as from the moral and intellectual incapables?

The question of reciprocity is a simple one in and of itself. It means mutual action and reaction, interchange and exchange. But the difficulties are numerous when the attempt is made to carry out the reciprocal idea; largely because of the selfish interests of individuals and institutions. Yet there are some real difficulties in the way of its being completely and satisfactorily adopted and practiced.

The first difficulty is in the great diversity of the laws of the numerous States, and with that comes the lack of uniformity, in the several States, of the standards of education, and besides that a perfectly impartial examination by each State Board of Dental Examiners is requisite.

Then there are the ethical standards. How can reciprocity be fully recognized without the ethical rules being considered? If the law in one State allows an unethical man to practice, how shall a State board of another State refuse him a certificate to practice, if they recognize reciprocity as a principle of law?

The present State Board of this State is in sympathy with the spirit of reciprocity, but in some States the boards are said not to be in harmony with the idea, and in other States the laws are against the proposition.

It does seem so self-evident to every fair-minded American, as to need no argument to prove it, that no reputable, law-abiding citizen of one State should be debarred from pursuing his calling in another State, whenever he may need, for any cause, to change his residence. The question of his belonging to any society in the State he moves from should not prevent his acceptability, for some very disreputable persons belong to reputable societies, and some reputable persons belong to no dental society. The culmination of reciprocity will take place only when the legal, educational and ethical standards of all the States are the same, and these conditions will be attained only when our laws are equal and just, and our educational institutions and State Boards work on the high plane of altruistic purposes.

In matters pertaining to our own State, the county and local societies can most efficiently aid the State Board in enforcing our State law by securing competent testimony and other data when prosecution is determined upon. They can also secure the history of disreputable and illegal practitioners.

It is contemplated in our law that the local officials shall bring illegal practitioners into court. To get the officials to do their duty the local societies can and should be active in securing indictments when necessary, or otherwise see that the proper proceedings are taken to enforce the law.

The State Board stands ready at all times to do their whole duty, and will advise and assist in local matters when possible.

The Board in the past has been handicapped by conditions it was not responsible for; but it is their hope that under the new law all political factors will be eliminated. The State Society can do much, as it has done in the past, to sustain the board in its efforts to properly enforce the law.

ROACH'S MOULDABLE PORCELAIN.*

BY E. J. PERRY, D. D. S., CHICAGO.

Roach's mouldable porcelain is an opaque porcelain body of great strength, which is moulded in the cavity model without a matrix of any kind. It fuses at about 2000° Fahrenheit, and it is cemented into the cavity of the tooth. What the substance really is when baked, chemically speaking, or what it is relatively, we shall not here consider further than to observe in passing that when fused it seems to deserve the designation of porcelain. There is in the minds of some a doubt as to whether this material is a true porcelain or not. This certainly need not concern us. Its physical properties alone are of vital interest to us as practical dentists. Dr. F. E. Roach, of Chicago, compounded and inserted the first filling of this material, and it is due to his indefatigable labor that it has been brought to its present state of utility and worked out into a system of practice.

These first fillings were made over two years ago, and during these years much experimentation and many changes in formulæ have been made, and it is only within the last few months he has got the material in its best and settled form, so that it is safe to place it in the hands of the profession as a commercial article. I have fillings in use for most of this time, and I have known some of the difficulties experienced in systematizing the work and studying the peculiarities of the various formulæ. The child is now over 2 years of age, and has absolute definiteness of character and form, but no one who has not been with this infant from the moment of its birth can know anything of the difficulties we have had in raising it. It has run the whole gamut of infantile diseases, from colic to chickenpox.

Roach's mouldable porcelain before fusing consists of a powder and a liquid. When well spatulated, it works to the consistency of dough, and has a similar fiber-like quality. In five minutes or less it sets or crystallizes. It can be placed into the furnace even before it is fully crystallized. The shrinkage in fusing, as shown by tests made, does not exceed three per cent. This product is exceedingly hard, grinding as hard as the densest artificial tooth. It has crushing strength much beyond any of the translucent porcelains in use. It is impervious to water, holds its form in the furnace; even the sharpest lines are brought out. The mass appears to be identical in form after fusing minus the slight shrinkage. The fused mass can be ground and polished. It possesses the distinctive and peculiar quality of adhering inseparably to oxyphosphate of zinc cement. No etching is needed to produce the adhesive surface. Mouldable porcelain is a non-conductor of thermal and electric changes, and it may be said, to put it comparatively, that it differs from the translucent porcelains in the following particulars only: It is opaque; has infinitely greater strength; will mould in the cavity model; no matrix being used; adheres to the cement inseparably without etching; has about fifteen per cent less shrinkage, and may be ground and polished.

---

* Read before the Illinois State Dental Society, May, 1906.

INDICATIONS FOR USE.

Mouldable dental porcelain, on account of its opacity, is not indicated in the exposed cavities in front teeth. It is indicated in large cavities in any tooth posterior to the cuspid. In some mouths, however, where the teeth are very conspicuous, its use in the bicuspids is not permissible. There is a class of cavities in molars which the operator can not fill with gold. He has the alternative of crowning or filling with amalgam. The latter but postpones the former, and the crown is not desirable for several reasons. Mouldable porcelain is most especially indicated here, and is probably its largest field of usefulness at the present time. These large restorations in my practice have given most excellent results. I have been able to cut out perhaps sixty per cent of crowns in this class of decays. In former years where half of the natural tooth was lost by decay, my rule was to grind to a little above the gum line and engraft a crown. Now, unless the tooth crown is lost entirely, I do not crown at all, but restore with mouldable porcelain. This is infinitely less painful to the patient; less laborious to the operator. The dental ligament is not lacerated, nor do the soft tissues recede. No chronic gingivitis is seen; no misfits hid under the gum to catch food and inflame the tissues, and the best of crowns do this to some extent. In that large class of cases where you formerly were compelled to crown with gold or porcelain, using a cope, this substance here offered for your consideration gives a safe and sure refuge. It occupies a field not heretofore taken by any substance. The gold inlay coming nearest to taking command. While the gold inlay may well be used in the smaller restorations, in the larger ones it does not fill the bill, besides being expensive and impracticable to make. The gold inlay is a useful substitute for the large filling, but not for the large restoration. I may here put in a plea for eclecticism in practice in the matter of selecting the material to be used in a given case. Any substance is best under its indications, and this even may be modified by the skill of the operator, who must be entirely honest with himself. In other words, he must do that which he himself can do best. No one material which we now possess fills all the requirements in all classes of cavities, and the operator who is broadly eclectic will choose the material indicated in the case at hand, be it translucent porcelain, mouldable porcelain, gold filling, gold inlay, or the much despised yet most used amalgam. Any one of these is best under their indications for use, and the operator who is skilled in the use of each of them and can discriminate their indications wisely is the man who will likely get the best net results in general practice. It is therefore not to the point to say that mouldable porcelain does not fill the bill in this case or that. It is not offered to supplant the gold filling, the gold inlay, nor yet even the amalgam. It is offered to fill a place which none of the foregoing can fill. The gold filling being impracticable, if not impossible, the amalgam a failure absolute, and the gold inlay lacking in adaptability. The gold inlay will never be used as a restoration in the common acceptation of that term. the word restoration is used to differentiate distinctively between a filling having three or more walls, and a filling having one, two or three walls, or no walls at all. It is in these restorations where I say that mouldable porcelain has its most especial indication for use, and where its use may eliminate the necessity for the crown with a cope or band.

Mouldable porcelain has another field totally unoccupied by any other substance, in the perfect fitting of porcelain crowns where no cope is used. No ready-to-wear crown can be perfectly ground to fit the root end. Where a facing is used, with a post, and a base or floor of platinum, and porcelain added to the lingual side, as in incisors, cuspids and bicuspids, the platinum base not only does not absolutely fit the root end after the crown is baked, but the metal base does not adhere to the cement. These cases may all be fitted or refitted with mouldable porcelain. No substance has ever been offered us to secure perfect adaptation to the root end in the cases mentioned, and the cement has been asked to do it for us. In this special place mouldable dental porcelain has absolutely no competitor.

Other indications for use may be in making a complete crown, with one or more posts, or instead of posts a box-like cavity may be cut into the pulp chamber and a stem of porcelain extending down into this will hold the crown firmly. It may also be used in connection with a diatoric tooth, forming the connection between the root end and the crown. The mouldable porcelain may be used to make a lining for a translucent porcelain inlay. The methods of procedure in all the foregoing uses of this porcelain will be taken up under the head of technique of manipulation.

CAVITY PREPARATION.

Cavity preparation in this work is not entirely distinct from the same for inlay work in general, but is so vital to success in the use of mouldable porcelain that I will give a few general suggestions. Cavity forming must have a definite principle underlying it. When the decay is all removed, so that the operator can survey the cavity walls as left by the caries, he can then plan his cavity form from what there is of solid tooth structure left standing. First, his cavity form must be so that it will draw, that an accurate impression may be taken of its form. Undercuts must be leveled up with cement, or cut away, so that the impression will draw. If this is not done, it is not possible to obtain an accurate model, or even draw a matrix. And here I wish to observe in passing that cavity forming for inlay work has done as much for cavity forming for gold and amalgam work upon scientific lines as all that has been said on extension for prevention. Proper cavity forming for inlay work will usually carry the cavity margin to an area of comparative immunity from decay. These margins have been extended not merely on the theory of extension for prevention, but from the necessity of access and retention. So I say the inlay worker (who has not thrown away his pluggers) makes a better cavity form for gold and amalgam work, because of his training in inlay cavity formation. If you will prepare your cavities for gold fillings as though you were to inlay them, then cut your grooves for retention, you will have an excellent cavity; if not an ideal one. In the large restorations, even though the walls may be fairly strong, it is well to cut them down a half or more, especially if the pulp be dead. Sufficient retention may be obtained in the pulp chamber. This not only greatly simplifies the case in the matter of obtaining access to the roots for treatment and filling, but in the impression taking and the making of the restoration as well. It is also best for the reason that the line of union or joint between the inlay and the cavity margin does not come in a place where the abrasion of mastication will fracture or chip the porcelain or the cavity margin. The juncture of the inlay and the cavity wall, whether in gold or amalgam filling or inlays of any kind, is the weakest and most vulnerable area of the filling or restoration, and if the operator can so plan his cavity as to not only extend these margins to the area of greater immunity, but also to a point where the force of mastication may not come against them, he will have small cause to worry about his margins rounding in use. This, of course, can not always be done, as in some cases the line of juncture must cross the grinding surface of the tooth. This line here spoken of can be laid in the sulcus in such a way that it will be protected by the summit of the cusp. The line of juncture crossing the grinding surface of the tooth must in no case be at the summit of a cusp. Cavity forming must be undertaken with a definite idea in view, with the idea of employing a certain force for the retention of the inlay, as well as for the protection of it and the cavity margins. This force is now known as frictional resistance. Dr. Roach is the author of the term. Several years ago, when studying the force which retained an inlay, Dr. Roach conceded that it was not often possible to key in an inlay, and observed that the lines of the cavity should be at angles more or less acute; that the floor should be, if possible, at nearly right angles to the walls. At least, the general form of the cavity should be built on straight lines and angles, and not in curves. The force here exerted in the retention of the inlay he named frictional resistance. The successful inlay worker, whether he knows it or not, uses this force for the retention of the inlay filling. The cavity preparation for any filling or inlay which does not follow these lines will not be successful. That prejudice which holds tooth structure so sacred that it interferes with a proper sacrifice of it, where scientific cavity forming demands its removal, is responsible for the loss of many a good tooth. The removal of the decay and the squaring of the ragged margins is not scientific cavity forming. It is not cavity forming at all. Cavity forming must be scientific in extending the margins to a safe or safer area, and on mechanical principles, in that it is box-like, so to speak, in form, and is not only accessible, but it is self-retentive. There is no cavity where frictional resistance can not be used to retain the filling or inlay. It may be often at what may appear to be a wanton sacrifice of tooth structure, but if it is shown that the salvation of the tooth and the success of the restoration depends on it, it is not only justifiable, but it is a duty we can not honestly shirk. This method of cavity forming is done nearly painlessly, by stones run at high speed in running water. The squaring of the floor and the straightening of the lines is done in a dry cavity, with cross-cut fissure burs, and inverted cones. Where a full crown is to be made, is determined by the same rule which would lead you to decide to crown with gold, namely, the standing walls so broken and frail as to preclude the possibility of forming a cavity with reliable walls. In these cases the whole of the standing walls are cut down to within a short distance of the gum, or, if part of the wall is strong enough, it need not be cut down quite so low. With square and cross-cut fissure burs, a box-like cavity is cut out of the pulp chamber. This pulp chamber box is the anchor for the crown. Its margins may be extended laterally to near the margin of the tooth. This forms a double box seat for the crown, always following the general plan of square cavity formation. Where the seat does not appear secure enough, or where the decay has proceeded so far as to preclude the possibility of the preparation of the crown seat on these lines, a post may be used in the following manner: The post, of course, is of platino-iridium. Enlarge as for a post in any other work. Then place the post in position before the impression is taken. This will come away with the impression. Before filling this impression, coat the projecting post with wax, so that it will draw out of the cavity model when moulded.

IMPRESSION TAKING AND MODEL MAKING.

Having the cavity prepared, the next step is to obtain an impression. After much experimentation it has been found that the high fusing impression compound is best for this purpose. Where the cavity involves the mesial or distal surface of the tooth, a matrix of thin copper, from 28 to 46 gauge, annealed, may be used to prevent wedging against the adjacent tooth. In many cases a cup or tray may be used. The necessity in this matter is to secure and maintain uniform pressure of the compound on all the surfaces of the cavity, so that an exact copy of the margins may be obtained. The pressure should be maintained until the compound is hard enough, so that it will not be distorted or moved the slightest. After chilling with cold water, the impression can be carefully coaxed, not forced, from the cavity. The cavity surface of the impression can now be examined, and if it is seen to have dragged at any point, the cavity must be recut or the overhang leveled up with cement, and another impression taken. The next step is to take a bite in wax. A rope of soft wax is placed between the teeth, pressing it well into the cavity. The patient is instructed to close the teeth normally, and not to open until the wax is thoroughly cold, so that it may be removed without distortion. The cavity is now filled with gutta percha and the patient dismissed.

We now come to the question of making the model. It has been found that copper amalgam makes the best model for this work. Uniform results can be obtained only by the closest attention to detail, and right here it will be observed how very imperfectly a cavity in a tooth may be filled with amalgam. One must study the conduct of amalgam under different methods of manipulation. Only chemically pure copper amalgam should be used, preferably Kester's. This should be heated in a copper ladle. Place the amalgam in the ladle, which is now filled half-full with glycerine. When the glycerine boils, it will be seen that the globules of mercury begin to appear on the surface of the amalgam. Almost instantly after this, and as the globules grow larger, the amalgam must be picked out of the glycerine and placed in a mortar, and ground thoroughly. Some use an old iron spoon, or the blade of a case-knife, and hold these over the Bunsen burner. This often results in overheating; is unsafe, and unscientific. There is nothing fickle about copper amalgam. It will always do the same thing under the same conditions. To secure uniform results we must always treat our materials in a uniform way. If the amalgam is overheated, it is spoiled. If it is overheated in one place and underheated in another, as it will be where the pieces are both large and small and held over a flame, it is not likely to act in a dependable way. After the amalgam is thoroughly ground, it is then washed in warm water and rubbed and worked for some ten minutes in the hand. It should be worked until perfectly smooth, and as it thins up under manipulation, the surplus mercury must be squeezed out. The impression, which has been set in a bed of plaster-of-paris, is now filled; beginning with small particles and with small amalgam packers fill into the deeper and sharper places of the impression. Now a larger piece is added, until it is built up so as to be of sufficient strength. Care must here be used not to pat the amalgam or use undue pressure, as when you do you bring the mercury to the surface and into the thin sharp places, and margins of the cavity. This thin overloaded amalgam will not set sharp, but will round or not fill. This is because by manipulation you have overloaded with the mercury the sharper places, drawing it from the body of your filling, and doubtless this explains why many amalgam fillings are poor, and if you could take them out next day, as you do this amalgam model, you would see that the filling was a failure the first day. This should now be set to one side for twelve hours, and when separated, if you have packed carefully, you have a perfect model. The model is now placed into the wax bite and both sides run up in plaster, which makes an articulation. When separated and the wax removed, the copper model is coated with sandarac varnish. This produces a smooth, hard surface.

MOULDING.

We are now ready to mould the porcelain. Place on the slab a few drops of the liquid and a quantity of the powder. Oil the cavity model with olive oil. Now quickly spatulate, adding the powder quickly, until the mix is quite heavy, using considerable force, so as to grind the powder well into the liquid. This should be done with a quick motion. Now dip the fingers into the powder and take the mix into the hand and work to the consistency of dough and quickly force into the cavity model, and almost instantly remove. Then gently return it to its seat. If there appears to be danger of sticking, it can be removed several times, or the model re-oiled. Do not place the mix into the model and leave it to get hard, as you may forget it, and return to find it adhering so firmly to the cavity model that you can not remove it at all. When it is about as hard as recently mixed plaster, it is ready to carve. If there be an occluding tooth, when the mix is first put into the model the reverse side of the articulation must be placed on, so as to obtain the marks of the opposing tooth, and the carving which follows must be done with reference to this. Where the cavity is deep, and difficulty is had in removing the inlay from the model, a hole may be drilled through the bottom of the plaster, copper, and all. A small instrument may be run through this and the inlay tipped up. This enables the operator to unseat the inlay and not distort it or fracture its margins. Again, where the adjacent tooth forms an overhang, and a contour is desired, the model side of the articulation may be broken at this point. The distal or mesial side of the inlay may be carved to fit the requirement of the interdental space. The broken piece can be put back in position and the contour determined. A perfect interdental space can be made in this way.

CARVING.

The carving or shaping of the inlay is simply the restoration of the tooth to its original shape minus whatever changes the occluding tooth makes necessary. Perfect restoration to original form can not always remain, because of the changed relation incident to the decay. The opposing tooth in most cases determines or limits the artistic work of the operator, and therefore no instruction is at all necessary, other than to observe the general rule, namely, to restore the tooth to its original form as nearly as possible, having reference to the antagonizing tooth. A sharp carving instrument is needed. The small blade of a penknife is as good as anything.

BAKING.

Having finished the carving, we are now ready for the furnace. The inlay is generally pressed into a bed of powdered silex, the cavity surface being covered, including the margins. The beginner should make several bakes of samples so as to determine the proper heat and fuse. The sample baked should be mixed exactly as you mixed for the inlay, and should be formed into a small block with sharp angles, for the very evident reason that a proper bake will show the sharp lines; an overbake will round them; an underbake would lack in hardness. It will be noted that the mix greatly affects the fusing point. The liquid acts as a flux, so that the less liquid there is used, the higher will be the fusing point. It is desirable to fuse the body of the inlay on the first bake, so that it will not be refused in the second or refitting bake, and therefore the sample bakes should be accurately mixed. The condition of the furnace should be noted and a record made. After the first bake, the inlay is set into the model and it will be seen to have shrunk, as formerly stated, about 3 per cent, and a refit is necessary. The model is oiled as before, and the mix is made as before, except that it is thinner, more liquid proportionately being used. With a small spatula this is placed on the cavity surface of the inlay, care being taken to put it upon the margins. The inlay is pressed into the model and treated as before. When set, the margins carrying the surpluses are trimmed off and the inlay baked as before, with the exception of the lower heat. This point in each furnace is determined by a trial bake of the same mix. After these fusing points are determined, the sample or trial bake will be unnecessary. Two bakes are all that are needed in most cases, as the shrinkage does not amount to enough in the added porcelain in refitting to affect the fit, though a third bake may be made and a very thin film of porcelain added, and a still lower fuse made. An automatic furnace, or one with pyrometer attached, should be used, and at about 1700° F., the first test should be removed, and the best product determined from this point on.

I know of no way of baking porcelain with scientific accuracy except by the use of the pyrometer or the automatic furnace, especially where the body to be fused is below the fusing point of gold.

SETTING THE INLAY.

No etching is required, and the setting otherwise does not differ from any other inlay restoration. One thing, however, I have noted in practice, that the adhesion of the cement to the restoration is much stronger than to the tooth cavity itself, and I have these restorations now returning, and I have yet to see a single case where the cement has washed out. The character of the cement seems to change, and whether it is a chemical change or not, I do not know, but thus far it seems insoluble in the fluids of the mouth.

In conclusion, let me say that no one, even the porcelain expert, may expect that he will have no trouble with mouldable porcelain. He must learn its characteristics. If he will follow the way blazed out by the inventor, and those who have gone into battle and conquered the material, he, too, will be its master, and until he is the master of the material he will be humiliated by its domination over him, but I say to you that once you are the superior of this force, you will have added to your equipment an ally in the war against dental decay second to none you now possess, and render to your patients a service for which they will call you blessed.

THE ESSENTIALS IN ELECTRIC OVEN CONSTRUCTION.*

BY L. E. CUSTER, A. M., D. D. S., DAYTON, OHIO.

There is no perfect conductor of electricity. When an electric current is caused to flow through a conductor the latter becomes heated. The production of heat by electricity depends upon two factors, the volume or ampere strength of the current flowing, and the resistance of the conducting agent. As the volume is increased the heating capacity is also increased, but this is not apparent until the current meets with some resistance. The unobstructed flow of any quantity of the fluid does not produce heat. It is only when a poor conductor is placed in the circuit that we have this manifestation. All metals are good conductors yet these vary widely in their conductive property. It at one extreme we take silver at 1, bismuth at the other extreme offers 87 times as much resistance. All the other metals have varying resistances between these extremes.

The electric oven when used for dental purposes must produce a heat of about 2600° F. and in practice platinum serves best for this purpose. This metal has six times the resistance of pure silver. Now the melting point of platinum being about 3600° F., it would seem that we have a margin of about 1000° between the melting point of porcelain and platinum, but I am led to believe that in practice omitting the loss of heat due to distance of the object from the wire and any intervening covering that when a platinum wire is heated electrically it "burns out" as it is called before reaching 3600° so that we have not a safe margin 1000°, but probably only three or four hundred.

This, I believe, is due to the fact that an electric current, as above stated, is the heating agent and I account for it in this way: When a metal is heated its atoms or molecules have a wider amplitude of movement and under the influence of an electric current they take on a wider range than would be the case if the wire were heated from some other source. In this way a dissociation of the molecules at some point in the wire having begun under the high heat and the resistance at this point being increased thereby, a burn-out occurs before the main body of wire has reached nearly 3600°. As a proof that a permanent molecular change takes place after continued heating, even at a moderate temperature, the oven gradually increases its resistance and in the course of time a crystallization of the wire is visible even to the naked eye. Old ovens consume less current and heat up more slowly than new ones. This is due to the fact that the molecules of the wire have gradually moved from the relation in which they were placed in the drawing out of the metal in wire form. We may say that they have become polarized. This polarization takes place more rapidly under the higher heats. A single over-heating shortens the life of an oven more than a hundred heatings at a proper temperature.

---

* Read before the Chicago-Odontographic Society, April, 1906.

While the foregoing observations apply more especially to the behavior of ovens when used on the direct current, it is a well-known fact that the deterioration of the wire takes place even more rapidly on the alternating current. Ovens do not give the service on the alternating that they do on the direct current.

In view of the facts, therefore, that in the practical working of the electric oven for fusing porcelain there is at best but a narrow margin between the fusing of the porcelain and the destruction of the heating wires, it is apparent that in the construction of the oven every detail which would produce an even heat and an unobstructed application of the heat must be observed. It is not only essential for the life of the wires but for the object treated. We must take advantage of all the conditions that tend to secure the fullest and most rapid effect of the heating agent upon the object treated.

The first condition would be the distance of the porcelain from the heat producing wires. The closer we can bring the porcelain to unobstructed heat radiating wires, the less heat will be required of the wires and the margin between that and their fusing point will be greatest and in proportion as we remove the object from the source of heat must the heat of the wires be raised. It is therefore important not only in point of economy, but for the life of the oven to place the wires the shortest practical distance from the porcelain. It is found, however, that to produce an even fuse of the porcelain, about ¼ of an inch should be left for circulation of the heat.

The second condition favorable to the life and efficiency of an oven is the unobstructed radiation of heat from the wires. When a wall is introduced between the wires and the porcelain the partition causes a double transformation of heat which can not be accomplished without marked loss. We have first the radiated heat from the wires received and conducted through the intervening wall and again transformed into a radiated heat. Now the fusing point of the porcelain remaining the same it is evident that where a wall is interposed between the porcelain and the wire that to fuse the porcelain the heat of the wires must be raised as much higher to compensate for the loss by the double transformation and over and above this the additional distance necessitated by the partition itself. So it will be seen that a wall does two things, it interposes a non-conductor and it removes the source of heat from the object treated. The winding of wires upon the outside of a porcelain or clay muffle is not the correct method of construction. Nor will it do to go to the other extreme and hang the wires on projecting lugs on the inside, for in so doing we have a wasteful method. But if the wires are wound upon the inside of the muffle embedded just deep enough to be caught in the clay, we have the best conditions. It is an important detail to fill the spaces between the wires with clay not only as a protection to the wires, but as a heating surface.

During the life of an oven there are two opposing processes going on. The clay is shrinking in volume and the wire is getting longer. A straight wire will soon break from its investment. This, of course, suggests the winding of the wire in short curves which overcomes this trouble. Some years ago I made a few ovens by winding with a wire of two strands closely twisted together. This produced a wire which had no straight section anywhere in its length. It effectually overcame the tendency of the wire to break from its investment, but the use of fine platinum wire was a greater objection than a single large wire laid in short loops. The use of a wire which has been wound on a mandrel and stretched out, when invested in the surface of the muffle can not in practice be covered to the same depth throughout and the curves near the surface becoming hotter than the deep-seated ones the life of the oven is thereby shortened. In a carefully constructed oven the wires should not only be laid in a series of short loops, but even these loops are bent by hand so as to present a double curve and in that manner it is possible to use a heavy wire, which practically curves from one end to the other and when laid in this manner, all wires can be invested to the same depth in the clay.

I now come to the fourth detail, which is of more importance than would appear at first thought. As previously stated, there is a continual shrinkage of the clay going on and this means that unless provision is made for it the wires will be broken in a mechanical manner. Fissures form in the clay in the course of time and the wire is often broken where it crosses a fissure. To overcome this, I have for some time been wiring the oven in a series of small loops and so placing them that the clay can be cut in sections between the neighboring sets of loops. This leaves the oven wall made up of a number of sections which instead of stretching the wire tends to condense it. A nice feature of this is that we have an automatic compensation. Any part of an oven which becomes hotter than another, the greater is the shrinkage of the clay and the condensation of the wire makes it a better conductor and it does not get so hot as at first. If these sections are made small enough there is no tendency to crack. Another and a very important point is gained by cutting the clay in sections. I believe that as the clay reaches a high heat, like the Nernst lamp glower, it becomes a slight conductor of electricity so that there is a tendency of the current to leak across from one set of wires to another. Cutting the clay in sections effectually prevents this. The wiring of an oven in sections and separated by a deep cut in the clay I claim to be one of the best improvements in years.

I have always maintained that so far as possible all the walls of an electric oven should be covered with heat producing wires. I do not believe that in these ovens we are consistent with the nature of things when an oven is made with an open front or one of the walls not a heat producing surface. I have always stood for this and repeat it again. This is not only essential for the even fusing of the porcelain, but for the life of the oven. The heat of an electric oven is obtained by radiation from every wire. It requires a high degree of heat to fuse porcelain. Does it not seem reasonable then that the more heat radiating wires with which the porcelain can be surrounded the less heat will be required of the individual wire? Just in proportion as we cover all walls with wire and these wound as closely together as would be safe from buckling into lateral contact will the required heat of the individual wire be lower and the life of the oven be longer.

One of the first peculiarities of the electric oven which I noticed where the wires were wound equally distant apart was the tendency of the heat to accumulate in the center of the oven. This condition was quickly met by winding the wires as closely together as possible at the most distant parts and at a progressing distance apart as they approached the center of the oven. In this way it is possible to produce a perfectly even heat in an oven not spherical in shape. In a muffle shaped oven with an open front a practically even heat can only be produced by making the muffle extremely long and large in proportion to the size of the porcelain treated and winding the wires very close together around the opening and even then it is not possible to produce such an even fuse of a large piece as can be readily done with a covered oven of even less than half the inside capacity. An oven having all its walls heat producing surfaces possesses the following advantages over a muffle with an open front:

It requires less heat of the wires and therefore lasts longer.

It fuses more evenly.

It has a larger capacity for even fusing in proportion to the size of the oven.

It is more economical.

I come now to a point to which if we wish to obtain the highest perfection in electric oven construction we must give some consideration. If a wire of uniform cross-section throughout its length is heated by a direct current it will be found to get about one-fifth hotter at its negative end. This is a fact not easily explained, but readily demonstrated in the laboratory. A difference of one-fifth in the heating of the wires is not a small matter, especially when the wire is already at a high heat and the value of an even heat upon the porcelain is considered. I am aware that no other manufacturer has taken this up and I see no other explanation than that they feel safer to make an oven that can be connected up any old way, for the average dentist, as I can testify, will pay no attention to this detail, and it is an accident if it is connected up as per instructions for positive and negative. But this is an essential in electric oven construction if we aim for the best results not only as to the life of the oven, but as to the porcelain treated it must not be omitted. As above stated, it is not readily explained, but it is a fact that the negative end of the wire of the same cross-section throughout becomes hotter at the negative than at the positive. This is compensated for by drawing a wire with one end about a fifth larger cross-section than at the other. Now, while such a winding produces a perfectly even heat of the wire throughout its length, if properly connected, it is evident that if the connections are reversed that we will have even a worse oven than if the wire was uniform section throughout. Years ago I had some confidence in the average dentist, but it is about all shattered and I am of the opinion now that as a commercial project, it is better to put out a fool proof instrument for a short life than one, although giving better results, for a longer time, which requires so much of the dentists as even dipping two wires in a glass of water to see which is positive and negative and connecting them accordingly.

I have only touched upon the essentials and underlying principles in the construction of an oven which gives the best results as to an even heat and the most efficient production of heat with the least strain upon the wire. Quick and slow heating and high heating ovens depend entirely upon the size and length of wire. They may be made to fuse porcelain in one minute or twenty. They may be made to give any degree of heat up to the melting of the platinum wire, but just in proportion as an oven is quick heating are the dangers of burn-out increased, and I would leave a final suggestion with you that the best results, not only as to the character of the porcelain fused but the life of the oven, are obtained in a slow heating oven.

ELECTRIC FURNACES.*

BY MR. J. F. HAMMOND, NEW YORK.

Gentlemen—I am very glad to have this opportunity to present a paper before your society, though I doubt if the few thoughts I shall offer will add greatly to the knowledge you already have relative to the

---

*Read before the Chicago-Odontographic Society, April, 1906.

Electric Dental Furnace. What I shall say will be from the manufacturer's standpoint, therefore, the difference in viewpoint between the maker and user may suggest something new, and I at least shall thereby profit. When I first commenced the manufacture of electric furnaces, Chicago gave me the greatest encouragement received from any section of the country, and on subsequent visits, though my object was purely commercial, I was received by many of your able associates with the right hand of fellowship and a cordiality that will leave in my heart a warm place for Chicago dentists.

Early experiments demonstrated that a current of electricity sent through a conducting wire would heat the wire to a greater or lesser extent proportionate to its length and resistance. Efforts were then made to concentrate the heat thus produced in a manner to give best results in a practical way. Later, through the experimentation of many men, the problem became clearer and it was found that with wire made from certain metals and electrically connected, comparatively high heats could be produced and maintained when properly applied in suitable furnaces.

Without going into a discussion of the exhaustive experiments undertaken to determine the most suitable metal to be used in the wiring of electric furnaces, it is enough to say that platinum, owing to its high fusing point, extreme ductility, freedom from oxidation, and with its other desirable qualities, was universally accepted as the best material for the purpose.

With the adoption of platinum as a suitable metal, the construction of electric furnaces of greater or lesser efficiency commenced and has resulted in their almost universal adoption for a multiplicity of uses, conspicuous among which is their employment by the dental profession for porcelain inlay work.

It is one of the objects of my talk this evening to outline to some extent the range of temperature at which an electric furnace, wound on the near surface plan, can in practice be safely operated day after day. To do this intelligently it will aid if I describe certain characteristics of platinum wire. This material subjected to extreme heat even considerably within its fusing limit, undergoes an almost imperceptible molecular change which continues during subsequent heatings to a greater or lesser extent proportionate to the intensity of the heat employed, resulting finally in rendering the wire brittle and crystalline.

Le Chatelier in a work entitled, "High Temperature Measurements," published in London and New York, page 126-7, states that "Platinum becomes brittle by simply heating it long enough." This is due, without doubt, to crystallization. Further on he says in substance that "silicon, silica and almost all the silicates, clay included, affect platinum wire."

What then does all this portend? That fire clay furnaces, electrically wound with platinum wire are of such brief existence that we would better return to the old coal furnaces with their dust and inconvenience, or to the newer gas, gasoline or oil furnaces with all their noise, dirt and disagreeable odors? By no means. While admitting that the wire of platinum wound electric furnaces deteriorates, it does so so slowly, under proper conditions, that the hundreds of hours of use of a quiet, clean, accurately controlled furnace generously compensate for the price paid. When we further take into consideration the fact that in most modern makes, the renewal of the furnace does not require the purchase of a new furnace complete, but only of a muffle, which represents hardly one-third of the original cost, the satisfaction of operation and the beautiful results obtained, reconcile us to any question of expense. I have laid much emphasis on the words "proper conditions." On them and their observance depend largely the economy and satisfaction to be secured in operating an electric furnace.

Of just what these proper conditions consist may be gleaned from special experiments made by myself to determine the extent of deterioration of electric muffles under varying temperatures. These experiments were conducted with identically made muffles and worked under definite temperature conditions. For this purpose I had four muffles of uniform size prepared, each was wound with the same length of wire, all of the same gauge, and the wire for the four annealed at one time before cutting into lengths; the clay was prepared at one time and worked into the muffles.

One of these muffles after being inserted in a Hammond furnace was carefully started on the first step and gradually moved up to a temperature of 2800° F, where it was allowed to remain. Fluctuations slightly above and below this temperature occurred, as the commercial voltage varied more or less from 120 volts, its normal intensity. This test was continued for about eight hours each day for ten days. On the eleventh day the muffle refused to start. On opening it to learn the cause of the trouble, it was found to have a shrinkage break, so called; that is, the wire had been pulled apart through the shrinkage of the clay. The extreme heat had practically fused the fire clay, which becoming a homogenous mass, grasped the platinum wire so firmly that when the fire clay cooled and shrunk, the wire could not give and therefore had to break. This break was repaired and the muffle again heated to the same temperature. It worked this time in all about fifteen hours, when after cooling, it again refused to heat up. Upon examination a second break was discovered. Another repair was made, but it failed to light up on the next heating.

On breaking up the muffle the wire was removed, and was tested for strength, malleability and resistance in comparison with a new piece of the same wire held over for the purpose. The muffle wire proved to be brittle, much beyond any crystallization the wire could have undergone in the short time it had been under a high heat, and the nature of the wire seemed changed in a marked degree in addition to which its resistance was slightly increased. These evidences of deterioration, coupled with the fact that the wire had been operating in a reducing atmosphere throughout the eleven days of heat which fused the muffle clay, would seem to confirm another statement by Le Chatelier that platinum wire in a reducing atmosphere undergoes a marked change by the absorption of the vapors from compounds of "silicon," clay being a silicate of aluminum.

A second test was made with another of the lot of four muffles with the temperature raised to between 2600° and 2700° F. The observed action of the heat on this muffle was gradually to biscuit the fire clay, i. e., to make it harder and harder, the hardening process extending over a long period, the muffle succumbing only after it had been subjected to this too strenuous heat for about 600 hours, or near four months of six hours each working day. The cause of the trouble in this case was, as in the first, a shrinkage break due to the gradual vitrifaction of the fire clay. Unlike the first test, however, a repair gave it new life for over 120 hours, or about three and one-half weeks on the same excessive heat. A second repair renewed it for over ninety hours, or about two and one-half weeks, while subsequent repairs gave it less and less "renewal of life" until I deemed it of too little value as a heat producer to repair again. All breaks or burn-outs, so called, were in new parts of the wire, showing its uniform rottenness. The wire of this muffle when extracted was found to be brittle and slightly reduced in size with indentations and roughnesses which almost disguised its identity as platinum wire.

The third of these special muffles was tested at a temperature of upward of 2550° F. This heat is capable of fusing most of the well-known tooth and continuous-gum bodies, though in some cases it will take a considerable time. The furnace was run at this heat five to seven hours each working day for over seven months or about 1,100 hours, at which time it gave out, the trouble being caused by mica flakes from the mica door falling on the floor of the muffle and fusing. In this case carelessness in not freeing the muffle from flakes before starting each day, resulted in the melting of these flakes into small black spots over the muffle floor and when a sufficient number of flakes fused on wires in one place, an alloying of the wires resulted and either a short circuit burn-out took place at once or a shrinkage break occurred when the muffle cooled. This muffle was repaired several times, but the mica trouble was not observed soon enough to make this as long or satisfactory a test as the muffle would have given had it been kept properly cleaned. How long a muffle will run at a continuous temperature of 2500° I am unable to say as the above test is the only authentic data I have at that continued temperature.

For occasional fusings of ground up teeth or other high fusing porcelains, a Hammond electric furnace is good for long service on extreme heats, but any platinum wound furnace continually subjected to a temperature above 2500° F. will reach its limit of endurance much sooner than one operated at a lower temperature. Therefore, if you have this high temperature work to do, use the furnace as carefully as possible, but do not become impatient if your muffle does not last as long as your neighbor's who is using regular porcelain inlay bodies requiring a much lower heat to fuse.

To emphasize this statement, I will now call your attention to the fourth and last tèst from the lot of muffles under consideration. This test was made at temperatures between 2300° and 2400° F., and at no time above the latter degree. This muffle was observed for approximately 2,500 hours; representing a use of five to seven hours each working day for about nearly seventeen months, at which time the test was discontinued, though the furnace was still in commission and good for a protracted period, the muffle being in fair shape. There was this difference between it and a new muffle, however, it required a full step advance on the rheostat at the last to produce the required heat, over that which sufficed when the test was first commenced, thus showing some deterioration of the wire, probably due to crystallization.

I should like to mention at this point that the above tests were heat tests and not service tests, no work being done in any of the muffles, though I doubt if working them properly would have affected the result.

To sum up, therefore, it is reasonable to conclude that electric furnaces properly wound with platinum wire, operated within common sense limits of heat, are of extremely long life, while furnaces subjected to prohibitive temperatures are liable to disaster in direct proportion to the overstrain put upon them.

Observation and experience covering a number of years have convinced me that a return to lower temperature after a period of intense overheating, does not eliminate the effects of the excessive heat, a shortened life of the muffle being the inevitable result under such circumstances.

A muffle, therefore, to remain serviceable to the full extent of its possible life, must be used only to produce temperatures it can endure without undue taxation of its component parts, which temperature experiment has shown is below 2500°.

The above tests were commenced over four years ago and covered a period of upward of two years. Since then much has been done in the matter of making muffles serviceable on the higher heats. These improvements have come about partly through more scientific winding, but more largely by the careful selection and proper admixture of the clay materials used in the construction to prevent ready vitrifaction and to eliminate as far as possible the element of shrinkage.

The results accomplished in this direction are shown in the prolonged life of the modern Hammond muffle on the higher temperatures.

There are still some cautions the user must observe to guard against accident to the best of muffles, chief among which is reasonable care not to spill any form of flux on the muffle bottom, as its fusion causes it to flow about the wires when its cooling offers a legitimate cause for shrinkage breaks. It may also cause the ruining of the wire of the entire muffle, if by its rapid fusion, it emits corroding vapors.

Metals of any kind fused in the furnace are dangerous to the wires through volatilization of the metal. Asbestos should not be used in a high temperature electric furnace unless combined with ground quartz as an investment, in which case it must be confined in or on fire-clay slabs to prevent its falling to the furnace floor.

In test number three, I spoke depreciatively of the use of mica about an electric furnace. The Hammond furnace has always been supplied with mica doors. This practice is to be discontinued, and a fire-clay door supplied with all furnaces sold in the future. Mica flakes are responsible for much harm when not kept from the muffle floor, and notwithstanding cautionary directions sent out with all outfits, many dentists fail to keep their muffles free from these flakes and are liable therefore to have trouble from this cause.

That modern muffles are improved over those produced in earlier manufactures does not eliminate the chief source of deterioration in an electric furnace, that of overheat. This can not be laid to the manufacturer, for though he supplies a furnace capable of intense heat, he also supplies minute directions for its use. On the other hand, in justice to the user, though he follows directions closely, he many times under- or over-bakes his work, owing to the unreliability of the current supplied his office, and unless he keeps a voltmeter constantly on hand or has remarkable eyesight and exceptionally good judgment, troubles arise which, so far as he is able to determine, can be blamed only on the "pure cussedness of inanimate things."

The eyesight can be and is trained by many dentists to a surprising extent which in conjunction with keen intelligence, produces expert results in the manipulation of porcelain in an electric furnace. The eye, however, can be depended upon only up to a limit well within the visible temperatures; when the incandescent state is reached the human eye becomes unreliable in close distinctions where a few degrees variation will bake, over-bake or under-bake a given piece of porcelain. It is then brought home to the operator that something to keep him informed of the temperature of his furnace during all the stages of the operation is not only desirable, but absolutely necessary to assure accurate work. There are many dentists also whose eyesight is not educated and who can not or will not become expert in the ordinary fusing of porcelain. Besides these, beginners have everything to learn about electric furnaces and the fusing of porcelain. All therefore may be benefited by an instrument outside of the furnace to accurately determine the heat in their muffles. For these reasons one of the modern styles of pyrometer should be an adjunct to every dental furnace.

Several years ago I purchased a Keiser & Schmidt pyrometer, which the importer informed me was the second that came to this country, and so far as I know, it was the first used in connection with an electric dental furnace. I exhibited it at conventions for over two years to demonstrate the high heat it was possible to obtain with the Hammond furnace. Later, the possibility of producing an instrument for measuring heat which would be efficient, durable and sufficiently low in price to allow it to become a part of every electric dental furnace equipment occurred to me, and experiments both exhaustive and thorough and extending over several years were made on this line. I am pleased to announce, therefore, that I have with me in Chicago at this time a commercial instrument of excellent capabilities that can be made a part of the Hammond furnace, without interfering with the detachable feature of the muffle; also, by a neat ventilated handle arrangement the thermo-couple can be fitted to enter the door of *any* electric furnace without interference with the work.

This entire pyrometer is sensitive and is substantially constructed, requiring no leveling or other fine adjustment, yet registering true temperatures within a reasonable limit of accuracy.

The new pyrometer has already been in operation for a number of months, but following the well-known policy of the house producing it, it has not been placed on the market until after exhaustive practical tests have been made, extending over sufficient time to insure that the instrument as offered for sale is a practical, serviceable heat indicator, thereby protecting the dentist from the risks so often incurred of buying a new material or apparatus before its possibilities are tried out.

PYROMETER FURNACES.*

BY MR. N. K. GARHART.

Until several years ago pyrometers were only used by parties engaged in scientific work. They were first introduced into the dental field by two dental manufacturing concerns who used them for the purpose of exploiting the high fusing properties of their products. At that time we had no conception that they would come into general use by the dental profession. But time changes all things, so the pyrometer is here to stay and is yet to be perfected to a point where it may be practically employed in the average dental office.

With one or two possible exceptions, the usual type of instrument that is to be found on the market is the very same one that was used by several dental concerns such as I have referred to heretofore. It is known as the "thermo-couple system." The generating unit consists of a small mass of rhodium or iridium, having welded to either side two heavy lead wires of platinum. Usually two of these units are mounted in the rear of the muffle. They are connected in series while the remaining two wires are connected direct to a very sensitive measuring instrument, which is better known as a mila-voltmeter. The "thermo couple" must be made from metals that will not be chemically or physically affected when they are subjected to very high temperatures. The highest fusing metals of the platinum group have been found to be best suited for this purpose. The "thermo couple" so made is nothing more nor less than a miniature heat battery. When it is subjected to heat a feeble current is generated, the amount of which increases with every increment in temperature. The current thus generated is recorded by means of the mila-voltmeter. It must not be forgotten that they are subject to one of the weak features possessed by all forms of heat batteries, namely that the lead wires ought to be kept cool by means of refrigeration, otherwise their capacity for generating current is enfeebled to the point where they become inaccurate. When operating under the most perfect conditions, the volume of current generated is so feeble as to necessitate the use of very delicate instruments. The instruments required for this purpose are of necessity very frail in construction, and for which reason are very readily put out of adjustment. I refer to one type where the instrument must be leveled before accurate readings may be secured.

---

* Read before the Chicago-Odontographic Society, April, 1906.

Pardon me for digressing from my subject. I wish to call your attention or rather refresh your memory by referring to the porcelain clinic which was held in this city several years ago by Dr. Brewster. It was during this clinic that the first pyrometer furnace was introduced to the dental profession. Let none of us overlook the fact that this honor belongs to Dr. Price, of Cleveland, Ohio. Doctors Byram and Jameson, of Indianapolis, attended this clinic and they were so impressed with the importance of the pyrometer that I fell in with the procession. Dr. Jameson requested me to work out a plan that he had in mind for the production of a novel furnace that would automatically stop baking when the desired fusing point was reached. His scheme depended upon the use of fusible metal plugs, the melting of which would mechanically open the main furnace circuit. I could not believe that his scheme would prove to be accurate nor scientific, so refused to waste any time with his invention.

I am greatly indebted to Doctors Byram and Jameson for the interest that they have taken in this subject and especially to Dr. Byram for the trials that he made of my experimental products. When taking up this work my first idea was to formulate some new plan of a pyrometer that would be accurate and at the same time permit the use of a recording instrument that was more rugged in construction. The "Nernst Glower System" came to me as any new idea will naturally come to any man, so the very first experiment proved to be very satisfactory. The automatic features of my furnace required a vast amount of experimental work to bring it to its present state of accuracy and efficiency.

The Nernst Glower is a German invention for producing light by passing through it ordinary high tension currents. It possesses one peculiar property which alone made it invaluable for my pyrometer. At ordinary temperatures it is a perfect non-conductor, but when heated it becomes a conductor of electrical currents. Its conductivity proportionately increases with every slight rise in temperature. It is very stable and does not appear to be affected, physically or chemically, when subjected to very high temperatures. It is a miniature rod, like porcelain in appearance, the dimensions of which may be cited as three-fourths of an inch in length by one-thirty-second of an inch in diameter. To each end is attached small platinum lead wires.

The chemical composition of the "glowers" consists of the oxids of the rare earths such as thorium, yttrium and lanthanum, or the very same oxids such as are used in the manufacture of the Welsbach mantel. It is quite a coincidence that both are German inventions and are solely intended for illuminating purposes, one operating from various electric circuits, while the other is devoted to gas lighting purposes.

Several of the "glowers" are supported within the muffle of the furnace, forming a part of the low voltage circuit afforded by the use of several dry cells, including the recording instrument. The second part of the low voltage system includes a shunt resistance circuit which is opened and closed by a push button switch. When the circuit is temporarily closed, a definite reading will be recorded, it serving for the purpose of testing the strength of the dry cells. So long as the cells are not impaired from use, this reading will remain constant. Usually a reading is taken once or twice every week and in the event that it should fall one or two tenths, the dry cells are to be renewed.

The "glowers" do not seem to deteriorate from use, although we provide a new set with every new muffle, thus eliminating any chance for error. We do not find that one set will record differently from another, consequently no changes are to be made in the fusing points when substituting a new muffle for an old one.

The next important feature of my pyrometer is the attachment for cutting off the current to the furnace when the desired fusing point has been reached. A small platinum contact is attached to the recording hand of the instrument. Mounted on the front of the case and insulated therefrom is a secondary hand which also carries a small platinum contact, having the same relative position as the one secured to the recording hand of the measuring instrument. The recording hand and the secondary pointer are a part of a resistance circuit which is shunted from the main high tension circuit. When moving the secondary hand to any desired baking point indicated on the scale, the recording hand will, when moving to that point, close this resistance circuit. When this circuit is closed the current actuates a quick break switch, thus opening the main circuit to the furnace. This short circuit is closed by the platinum contact of the recording hand touching the one on the secondary pointer, thereby completing the circuit. After the main circuit is turned off, the temperature of the muffle drops very quickly, hence the recording hand recedes to its zero position. The movement of the recording hand serves to open and close the resistance circuit as well as registering the heat in the muffle.

By diverting the current through another magnet, I am able to use the same resistance circuit for starting the furnace. The lever of the furnace must be brought back to the first heat contact before the circuit can be closed. The lever carries a small switch which closes the resistance circuit when moved to the first heat contact. When releasing the lever, a plunger spring device moves it to heat contact No. 2; the object of this movement is to prevent any danger arising from the resistance circuit being closed for any length of time. The first and second heat contacts are so wired as to constitute the lowest heat that may be had from the furnace when in operation.

Should the operator desire to operate the furnace without the automatic cut-off device, I have provided a single pole switch for the purpose of turning the current on and off. It is only necessary to turn the secondary hand to the highest figure on the scale so that it will not intercept the movement of the recording hand.

In conclusion, will say that it is practical to separate the pyrometer from the furnace such as placing the former in the operating room while the latter would be located in the laboratory, and in this manner have perfect control over your porcelain work. The different heats of the furnace could be thrown in or out, the temperatures observed and the main circuit automatically cut off when the desired bakings were reached without the operator leaving his patient save for the purpose of obtaining the finished work.

SOME PRINCIPLES IN FURNACES.*

BY F. E. ROACH, D. D. S., CHICAGO, ILL.

When asked by the Program Committee to take part in this symposium I hesitated to accept, as I felt that it would be almost impossible for me to write a paper on electric furnaces and not have it appear that I was blowing my own horn. For, very naturally, each man's production stands as the embodiment of his best thought, and to write a paper that does not contain some of my own ideas would hardly be expected; so that on this assumption I will summarize what in my mind are the essentials pertaining to this most valuable and indispensable part of our equipment. And inasmuch as what I shall have to say on the subject will, in a measure, be a reiteration of what the previous speakers have said, I will not go very much into detail, but will treat the subject from a rather broad viewpoint.

---

* Read before the Chicago-Odontographic Society, April, 1906.

The development of the electric furnace in its various industrial uses has kept pace with the phenomenal strides made in the many other purposes to which electricity is being applied, and today it is employed in one form or another in almost all electro-metallurgical processes, either experimentally, or on a commercial scale, and while it might be of interest to note some of its larger uses in the commercial world, we will confine our discussion to its application in dentistry. As a bit of history it may be well to mention the fact that while some of the laws of electricity have been understood for ages, its utilization for furnace heating does not extend over a period of more than half a century, and its first employment in dental furnaces dates back but a very few years.

Wright defines an electric furnace as an apparatus for bringing about a physical or chemical change in materials by the aid of heat obtained from the transformation of electrical energy.

Two types of furnaces are commonly used, i. e., the arc and the resistance. These two types are again subdivided into a number of classifications according to their construction and use. The arc furnace antedates the resistance type and was first recorded by Pichon in 1853 in the *Practical Mechanics Journal.*

Sir William Siemens was probably the first to suggest the electric furnace for extensive commercial purposes. Following him we have the work of Moissan, Faure, the Cowles Brothers, Acheson, Nernst and a host of other scientific and inventive geniuses applied in a similar direction. It is interesting to note in this connection that in the great number of books and magazine articles reviewed on this subject I have found but little of value pertaining to the construction, care and use of the type of electric furnace such as we employ. Nor does our dental literature offer much on the subject.

Whether the inventor and manufacturer have kept their knowledge as trade secrets or whether their modesty explains their silence, I am not prepared to say, but I will state that we need to know more about the various appliances we use, especially the electric furnace. There is nothing in our equipment that is more simple in construction than the electric furnace, and yet it is least understood and is probably the most abused. In treating the subject of electric dental furnaces we have to deal with the resistance type altogether and the platinum wire confined in fire clay is most commonly employed. Cryptol and several similar preparations have been receiving considerable attention for the past few years, but so far have not proven very satisfactory; the principle objections being the difficulty of controlling and confining the heat, and the necessity for frequent renewal of the material.

The platinum resistance furnace is not without its shortcomings, the most serious of which is the liability to burn out. This objection has not and, I venture the assertion, will never be entirely overcome, though its terrors are greatly lessened in the furnaces constructed with the view to ease of repair. The question that naturally arises just here is, what causes these so-called burn-outs? I am free to say that I do not know. Several times in the past four or five years during my experiments I thought I had solved the problem. All sorts of theories have been advanced from time to time, any one of which seem plausible. One will tell you that it is impurities in the clay, another that the wire was defective, and some one else says the different coefficients of expansion and contraction breaks the wire; and yet I have made experiments that seem to disprove them all. The short circuit is very frequently spoken of as a cause of burn-out, but it is so infrequent that it hardly deserves mention as one of the causes. At present, however, I hold to the belief that fully 90 per cent of the "burn-outs" are the result of breakage in the wire, due to the unequal expansion and contraction of the wire and clay. It will be understood, of course, that an arc usually occurs at the break, resulting in the familiar "burn-out" spot.

The rheostat is supposed by many to act as a conserver of the life of the wire by the gradual increase of the electric current, and the consequent increase of heat. This theory I am prepared to dispute. I maintain that a muffle properly wound and confined, so that the minimum amount of heat is lost by conduction and radiation, with proper amount of wire, will last equally long as the one having a rheostat. Doctor Taggart has made his own furnaces in this way for a great many years. I think he will verify this statement.

If a muffle is wound so that it contains sufficient wire to safely carry the current for which it is intended, there can be no need for a rheostat. Fourteen feet of 28 gauge platinum wire will safely carry 110 volts, and if confined in an air-tight casing with some good non-conductor of heat, it will afford sufficient heat to fuse any of the porcelain bodies now on the market. The greater area of radiating surface on the longer wire lessens the strain on the wire. As an illustration: If you have a room of a given size to heat, you will put in your heating apparatus with the view to supplying sufficient radiating surface to heat that room. You would not attempt to heat a 15x30-foot room with a stove the size of a teapot. The same principle applies in furnace construction. The greater the radiating surface of the heater, the less heat required to raise the temperature of a given space to a certain degree.

The electric furnace has advantages over other furnaces that are well worthy of notice, among which may be mentioned purity of heat, better control, cleanliness and freedom from noise or odors. The purity of the heat produced with the electric furnace is not to be equaled by any other, and for that reason stands pre-eminently at the head of the list for a means of baking dental porcelains.

In a well cured muffle there is absolutely no danger of gasing or cause for discoloration of the most delicate porcelain. I say a well cured muffle, and by that I mean one that has been carried up to a sufficient heat to drive off all moisture and impurities that may have gotten into the clay. Almost invariably a green muffle will discolor porcelain a bluish muddy color, and for that reason should never be used in baking a practical case.

By better control we mean that the heat can be more easily started and stopped, more readily and definitely increased or decreased and is decidedly more susceptible of automatic regulation.

For cleanliness and avoidance of noise and odors it is the acme of perfection. In the above mentioned advantages I desire to call especial attention to the advantages of automatic regulation and cut-off features now being employed. By means of the automatic cut-off all care and worry about the furnace is eliminated and the time formerly occupied in holding a watch and gazing into the furnace may be profitably utilized in some other way. Automatic machinery will always produce more uniform results than the human hand, and for that reason is employed wherever uniformity is desirable. The automatic and pyrometer features are also of great value in the preservation of the eye. Any oculist will tell you that it is injurious to the eyes to gaze into a hot furnace for the purpose of determining when porcelain is fused. Some eyes are capable of enduring such a strain remarkably well, but authorities are quite unanimous in condemning such abuse of this organ which is of such vital importance in our work. The automatic and pyrometer features also make possible the absolute closure of furnace, thus avoiding loss of heat through an open door, and the uneven bake of the porcelain. This closure of the furnace lessens the strain on the platinum wire and obviously extends its life very materially.

From 5 to 15 per cent of heat will be lost from a muffle having one end closed with only a mica door. The muffle should also be packed with some good non-conductor of heat, as there is a great loss by conduction. Another advantage of the automatic furnace is that more time will be taken in baking, with better porcelains as the result.

A few simple things that everybody should know about the electric furnace seem to be wholly overlooked in many cases. For instance, there was a case that came to my notice recently where a dentist in California shipped his furnace back to a firm in the East with the complaint that it was burned out, and when examined it was found that the only trouble was one of the terminal wires had become disconnected from the binding post, thus making a break in the circuit. There was not only the grossest ignorance displayed in this respect, but added to that was the fact that the whole furnace was shipped by express instead of removing the muffle from the casing and sending that only. This is not an isolated case, but such things are being done every day. The trouble with many of us is that we do not stop to look for the trouble when anything goes wrong with our furnace; if we close the switch and the furnace fails to heat up, we at once conclude that there is a "burn-out," when very often the trouble is with some of the connections. Every user of an electric furnace should provide for testing his muffle in case of failure to operate. This is easily done by taking a few feet of the ordinary electric light wire connected with a plug at one end and a small copper or brass point on each of the other ends. One of these wires should be cut and a lamp put in. The lamp will light up when points are brought into contact with the two terminal wires in the muffle if the wire is not burned out or broken. Some such arrangement will also prove to be a very great help in locating a break in case of repair. Where the wire has burned there will usually appear a spot, but a break will not show and a tester is indispensable. In the great majority of cases the burn will occur within three or four inches of the negative end of the wire, due to the excessive heating of the wire at this point.

The question is often asked if it is necessary to keep the wires covered. It is best to keep the wires covered as a protection against contact with anything that may be carried into the furnace and as a means of keeping nearly as possible uniformity of heat throughout its length; any exposed wire will become much hotter than the covered portion.

GOLD FILLING.*

BY DR. J. B. TAYLOR, MARSHALL, ILL.

In the year 1870 in this city, some one with Dr. before his name and the sign Dentist above his window made a gold filling for a man of the name of Mr. J. who, during the last month, applied to me for a minor dental operation and told the story. How such a filling was constructed the doctor and the Angels in Heaven, whom he has intrusted with his secret alone know. This I can say—it is a most beautiful specimen of artistic workmanship and one to command the admiration of a modern twentieth century dentist, after having stood the stress of time for thirty-five years.

We have all seen such specimens of gold work and no doubt wonder at our inability to cope with those of the past who made the shining metal their watchword and left the results of their skill upon the "sands of time." In presenting this paper upon the subject, "Gold Filling," I can assure you, gentlemen, that I am unable to offer anything new from my own discoveries. All I know is what I have gleaned from others by reading their opinions, by seeing operations performed, by hearing ideas expressed and by hard work at my own chair, which has taught me that to become a successful manipulator of gold as a filling material, one must possess or acquire three things.

---

* Read before the Eastern Illinois Dental Society, Tuscola, Nov., 1905.

First—Delicate sense of touch.

Second—Absolute correctness of vision.

Third—The patience of Job, and I desire to emphasize the fact that in my opinion with these three at our command, gold is the best medium offered to the general practitioner of dentistry for restoring a tooth to its natural function.

With the first acquirement we discern those points which tend to build for us a lasting or temporary structure, for by it we locate remnants of decay which cling to the deep hidden recesses of the cavity before us, ascertain our nearness to the pulp chamber, and take warning of frail, checked enamel margins against which failure would be an absolute certainty.

Second.—The man with the trained eye accomplishes results unknown to the workman who fails to see things as they really are. By it he compares, reflects and observes.

Third.—The man with patience succeeds where others fail. He builds a little at a time, never tiring, always sympathetic and kind, and when he has finished he has a house where gods may be proud to dwell.

I have chosen for my subject of consideration and discussion at this time a cavity familiar to all, located on the mesial surface of a left superior central, involving a small area of the labial surface, but not extending through the lingual. Corner of tooth intact. Cervical wall good. Pulp chamber not exposed. My methods of procedure in making a filling for such a cavity is as follows:

First.—With my enamel chisel I break away all frail enamel margins.

Second.—By use of a curved spoon excavator remove all loose decay. Apply germicide, carbolic acid or camphophenique and proceed with engine and round bur until apparently all decay and affected tooth structure has been removed.

Third.—Proceeding with engine from labial surface I break away the lingual part not destroyed by decay and shape it to conform with the labial, for I believe in all cases that surface should be sacrificed and restored, making a self-cleansing surface along that margin, of gold and enamel.

Comparison and observation have taught me that more evil results could be recorded from the oversight to make this extension than any one cause in the catalogue of dental failures.

Fourth.—Preparing the cavity for retention of gold often demands the operator's greatest skill, for to withstand the immense pressure exerted in mastication we must employ some scientific methods for retention, else failure comes quick and certain. With a No. 3 or No. 4 bur I cut away as much of the dentine as possible, leaving a strong wall of dentine and enamel to build against, then with a No. ½ cut a groove around the entire cavity wall, making it slightly deeper at cervical and incisal margins so that the filling when completed has a greater diameter within than it does on its exposed surface.

Fifth.—With a chisel and fine strips and disks I bevel the margins, preferring this to a perpendicular outline.

Sixth.—Apply alcohol, follow with carbolic acid and hot blast from chip blower and thus remove all trace of decay and other foreign substance.

Seventh.—The cavity being ready to receive the filling, I cut enough very small pellets to fill my retention groove at cervical margin and make the start without annealing, using hand pressure at first, following with automatic mallet. Too much time and care can not be spent in carefully filling all grooves or pits used for starting and retentive purposes. They are cavities and should be treated as such lest the deadly microbe with his scythe of terror gain entrance at the wicket gate and claim his victim. I use S. S. W. No. 4 cohesive foil for all cases. Get better results by rolling sheets in small ropes and cutting pellets in convenient sizes for manipulation. After one or two pellets have been placed I anneal each piece separately over an alcohol lamp and condense with a small plugger point, building the lingual surface as much as possible from the labial.

Gold burnishers and marginal trimmers are instruments of great value to the dentist. The cavity filled, I burnish it thoroughly and trim away all overhanging gold prior to using strips or disks. For the lingual surface I prefer a fine carborundum disk or point of small size to cut away all excess of gold and follow this with sandpaper strips and disks.

The filling as finished should present a mold of beauty as well as one of protection against the ravages of decay. It should be highly polished, free from pits, scratches and grooves. The line between the enamel and gold so fine that the trained eye with magnifying glass fails to discover any defect.

The workman who cares well for the small things builds a lasting treasure, and like the doctor whose filling spans the space of years,

> "Let us do our work as well,
> Both the unseen and the seen.
> Make the place where gods may dwell,
> Beautiful, entire and clean."

SOME POSSIBILITIES OF THE DISTRICT SOCIETY.

BY DR. GUY F. CORBEY, MATTOON, ILL.

In all ages, in all conditions of life man has craved association and companionship. It seems to have been the will of our Creator that he should. The more nearly his interests are of a similar nature to that of his neighbor the more readily is he drawn into association. Association does not always take the form of organization, but where a number of individuals are associated in affairs of mutual interest they have found it of advantage to be organized, which gives form and stability to association.

For a number of years the "State Dental Society" gave to many dentists of the state their only connection with dental organization. But for various reasons, recognized by the prominent members of the profession, it failed to attract a large majority of the eligible men. You can not improve a man by society or other effort unless you can come in contact with him and get him personally interested in the work under consideration. And the small number of eligible men who attend the state gatherings and the large number who attend the district meetings is one of the greatest arguments of the necessity and possible value of the district society. In fact, other argument is unnecessary. And for these reasons the state society has within the last eighteen months been completely re-

---

*Read before the Eastern Illinois Dental Society, Tuscola, Nov., 1905.

organized on plans with which you are as conversant as I, and have, as you know, resulted in the formation of a number of district or component societies.

It is the future of this "District Society" that I wish for a few minutes to discuss. Such a society is made up of individuals who are not only associated in a common profession, but being drawn from a compact territory have interests which are of a closer nature than those from communities widely separate.

We have in addition to general matters those which are of a local interest. Then we practice for a common clientage; I mean by common, those who have similar requirements.

It may seem to some that the dental requirements of the people the world over would be the same, and they are, namely, to prevent disease and irregularity of organs within and in connection with the oral cavity and to repair that which has been broken or supply that which has been lost by accident or disease.

But the way this may be accomplished may of necessity differ in different practices. If for no other reason than that of the difference in the ability of the patients to pay for certain operations. We all know that some operators can accomplish for their patients that which for another would be prohibitory simply because of their inability to pay for work of that character. And under such conditions where we can not expect to perform similar operations extensive papers and clinics on them can not appeal to us as practical. But members of a district society having similar requirements will find methods and ideas advanced of more immediate value than those of practitioners differently located.

Some may think it a waste of time to give the small society attention. Well, if it is because you are confident of knowing more than others, the society needs you. Feel charity for their ignorance and come regularly. You may receive a Carnegie medal for some of your heroic efforts.

There are few men after being in practice for any length of time that have not something original. If not a new operation or appliance, possibly a new way of applying an old.

Some of us may have originated mistakes the recital of which would be of value. It is often quite as important that our mistakes and the remedies for them be recorded as that success alone should be. It has seemed to me after hearing and reading some of the papers of the past that their authors had lost sleep in their efforts to forget mistakes and herald their success to the profession.

True, the rehearsal of failures is not of a nature to puff a man up. There are many of us who may find appearing before a body of any size not a little disquieting, even though we are perfectly sure of our point, and for such a small society fills a long felt want. While in college I never can remember not having had a severe attack of ague every time I was called in a quiz before the entire class, though before a recitation section composed of possibly fifty members I could tell what I knew with ease.

Our local society may be compared to a quiz room in that it grants a freedom to those of us who may be reticent in manner that we would not feel when meeting as a part of a large body.

It is not only the man who is the most ready to air his views to the public who has the most of value to say. But many times a man with ideas quite superior is of a nature so reserved as to prevent his presenting them to advantage before a large number. But meeting as we do in a small society, there is no reasonable excuse for a member feeling any hesitancy in advancing anything he may have found to be of value to him.

Most organizations start life with a great stock of enthusiasm, which after a few meetings, when the new is gone, so to speak, suffer a relapse from lack of interest. The district societies throughout the state have been no exception to the rule in the first particular, and it is now up to each and every member to put his shoulder to the wheel and make it an exception to the last. Each member should feel it his duty to be a producer as well as a consumer.

The nature of our work is such as to confine us, possibly to narrow us in thought, but this can be overcome if we make the effort of attending regular meetings of men of equal or superior attainments. There is danger of staying too close to practice. One who does becomes a mere machine of work to whom nothing has a value if it can not be represented in dollars and cents.

The "District Society" will continue to be of more value to the young man than to the older one, for the sufficient reason that he has more to learn. Yet it contains something for all, both old and young.

ETIOLOGY AND TREATMENT OF PYORRHEA ALVEOLARIS.*

BY J. C. CAPRON, D. D. S., MENASHA, WIS.

It is impossible to estimate the frequency of the diseased condition under consideration.

Up to the present time the attention of the profession has not been called to this disease as frequently as it should have been. As a conservative estimate it is stated that this form of trouble is the most common which attacks the teeth, next to caries.

Primarily pyorrhea alveolaris is a disease of the mouth, strictly speaking, of the gums. It is a gingivitis. Secondly, because of the fact that the disease is due to a process that respects no tissues, it affects the alveolo-dental membrane, and finally as a result of this producing an absorption of the alveolar process. As a consequence follows sooner or later the loosening of the teeth and their subsequent loss.

As far as the pathology of the condition is concerned we can take into consideration two kinds of processes, the first of which sometimes exists without the presence of the other; yet in reality we may assume two forms. In the first form, which is always present in these cases, and which marks the beginning of the disease we have simply the gums affected; at first only in the form of a necrobiotic process producing molecular death,—death of the individual cells.

In order to reach the etiology of the disease it seems to me that it is advisable to look at the causes which produce pyorrhea alveolaris. No doubt the simplest example of production of pyorrhea alveolaris is acute mercurial poisoning. If we look into the pathology of the production of this form of disease we can see that mercury does produce an inflammation of a mucous membrane, not only in the mouth, but in other parts of the body. We find that mercury is eliminated by the salivary glands and no doubt by other glands in the buccal cavity. As a result of this we have a certain amount of irritation so that this agent that has been eliminated by the system is the direct cause of the irritation of the mucous membranes around the teeth. (I will add here that it goes without saying that it will attack those places where there is the least amount of resistance from the blood vessels.) And now with the presence of pus producers we can readily see how an infection takes place and the full development of pyorrhea alveolaris.

---

* Read before the Fox River Valley Dental Society, Neenah, Wis., March, 1906.

Accordingly as a result of a study of this paradigm, it seems to me we are forced to the definite conclusion that in the first process that I have referred to there is necessary a something that is eliminated by the general circulation by means of the mouth; secondarily, it is necessary to conceive of an infection with pus producers.

In regard to uric acid there can be little doubt, as I find that the scrapings from the teeth almost always show its presence. It is not necessary for our purpose to go into the formation of uric acid in the system. It is not astonishing, therefore, as a result of this statement, that we find pyorrhea alveolaris very common in connection with diseases of the gastro-intestinal tract and in connection with either diseases or functional disturbances of the nervous system.

We now turn to the treatment of this disease. With the views expressed it would be readily seen that every one of these patients should be treated both by the physician and dentist.

The necessity for prophylaxis exists, first in removal of all substances that irritate; and, secondly, in applying methods calculated to carry out rational antisepsis of the mouth.

There is a great diversity of opinion in regards to the necessity for general treatment, but if the etiology of the disease as I have sketched it is correct, there can be no reasonable doubt of its efficiency. So that in order to get the best results I think it is necessary that both the physician and the dentist treat these cases, the one working in harmony with the other.

PROCEEDINGS OF SOCIETIES.

THE FORTY-SECOND ANNUAL MEETING OF THE ILLINOIS STATE DENTAL SOCIETY, SPRINGFIELD, MAY 8, 9, 10, 11, 1906.

DISCUSSION ON PAPER BY DR. C. R. TAYLOR.

"The Duties and Obligations of the Members of the State Boards of Dental Examiners."

Dr. Edmund Noyes, of Chicago:

A very important matter is contained in the latter part of the first paragraph of the paper, "Inside and outside of the letter of the law lies the spirit and obligations belonging to all the interests involved."

It can not be denied that the letter of the law requires careful consideration and obedience by all administrative and judicial officers, but it is always a fair presumption (unless a law is so bad as to make such an inference impossible) that the spirit and purpose of law is to enforce justice and promote the general welfare, and the interpetration and enforcement of all laws should always be carried out by both administrative and judicial officers with this fundamental purpose of justice and welfare kept steadily in view. The essayist recognizes the present necessity for state boards of examiners to exercise such supervision and authority over the courses of study in the dental schools as may insure the opportunity of their students to obtain an education sufficient to enable their graduates adequately to fulfill the duties of their profession, but he deprecates such necessity and says the authority to manage and control the dental schools should not be given to the dental examiners, but should rest with the educational department of the state, the most that should be expected of the state boards of examiners being the examination of the graduates of the dental schools.

It must be manifest that the exercise of this authority to examine the graduates of the schools implies the inevitable exercise of effective authority over the schools themselves, since the success and reputation, if not the very existence of the school, must depend upon the success of its graduates in passing the examinations of the various state boards. Since then so much power is inseparable from the necessary functions of a board of examiners, why it is not better to give to this one body of men all the authority and supervision which it is necessary for the state to exercise over dental education, as is done under the present law in this state? And would it not tend to uncertainty, weakness and probable antagonisms to divide such authority in the manner suggested, which would seem to require the placing in the department of general education for the state, physicians, dentists, lawyers, pharmacists, etc., who should have supervision of educational institutions for their several professions, in addition to the various examining boards for the same professions?

The essayist says, "Time will prove that it is not only a mistake in the laws allowing boards to direct or control dental schools, but just as equally a mistake for such institutions of learning to manage the state dental boards by seeking to dictate the appointment of members on the boards, or to direct them after their appointment."

These two lines of control or influence are so very different that they should not be compared in this way. The power of the boards over the schools is the power of the state, exercised by authority of law for the benefit of the whole people. If the schools are able to dictate appointments or direct the conduct of the boards they will be open to the suspicion of doing it for their own advantage without due regard for the public welfare, just as what we call political appointments dictated by the party bosses are open to the same suspicion, sometimes justly, occasionally perhaps unjustly. Of course such influence of the schools over the state boards exercised for selfish ends can not be too strongly condemned, but we should not forget the broader and truer view of the matter, namely, that the state boards of examiners and the faculties of the schools are both devoting their efforts to the same great end, namely, the adequate preparation of dental students to serve the people well in the practice of their profession. There ought always to be, therefore, the most cordial agreement and co-operation between the schools and the boards of examiners.

The essayist says, "No dental school is known where a full, complete and practical dental education can be obtained, and our laws are not for the best interest of the people and the profession or the individual student when they deny to any person the right to gain information and skill from any proper and useful source."

I do not believe there are any such laws as that. We have graduate schools of orthodontia, prosthetic dentistry and anaesthesia, and often hear of classes formed for instruction in inlay work, etc., and a great amount of information of one sort or another is communicated in public and in private at dental society meetings, and I never heard of any legal objection to any of them, nor to any other "proper and useful" source of information.

"A full, complete and practical dental education," is a pretty large acquirement, and requires the responsibility and experience of independent practice for its full accomplishment. It can not be successfully denied, however, that the best of our schools do give ample opportunity to acquire an education complete and practical enough to enable such graduates as have been good students to enter upon practice with safety to their patients and credit to themselves, and I think it would be impossible to name any other means by which an equally good dental education could be obtained. The essayist seems to have a very poor opinion of the faithfulness, honor and regard for the public welfare of those who conduct our professional and literary schools when he says, "The facts are today that a larger per cent of the graduates of our higher schools of learning, yea, of our professional schools, could not and would not pass the preliminary and final examinations and secure their diplomas were the financial and personal factors eliminated."

It strikes me this is a rather serious accusation to make against the men who are in close relations of influence and direction over the young men from our good families who are being trained for positions of honor and usefulness, and there ought to be a pretty solid array of facts to back it up or it should not have been made. By "the larger per cent," I suppose he means over half. I do not believe that over half of the students of either professional or literary schools are unqualified for entrance or graduation. Probably the essayist believes that reputable men in their private practice have a due regard for the best interest of their patients and would not sacrifice that for their own personal gain or convenience.

Why, then, should he suppose that these same men when they manage a dental school are ready to sacrifice the interests of the community and of the better class of students for a few additional tuition fees, likely to be of doubtful value in comparison of risk or loss of standing and reputation of the school? An experience of a good many years in dental school work and regular attendance upon faculty meetings has fully convinced me that such criticisms and complaints apply to only a very few stragglers, and the main body of students are fairly well qualified both for entrance and graduation.

The large per cent of failures to pass the state board examinations probably indicates two quite different things. First, that the purpose of these laws requiring the examination of graduates is being accomplished in the pressure it is exercising upon the schools to do better teaching, and it can not be denied that some of the schools are probably in need of it. The percentage of failures from some of our best schools is so large, however, as to justify the suspicion that some of the examinations have not been carried out with that justice and wisdom which is desirable. This reminds me to say that the paper, and this discussion hitherto have been rather too much taken up with side issues, and the subject announced, the duties and obligations of the board members have received comparatively little attention. The most important and the most difficult of all the duties of state boards is in the examination of the candidates for licenses, and I know of no public duty that seems to me to require greater wisdom and sounder judgment than this. It is very easy, comparatively, for an instructor to examine his own students at the close of the term, in the subject he has just been teaching them, and to make a fair judgment of their proficiency, and it is easy for moderately good students to pass such examinations, but at the end of a three years' course it is to be expected that many of the details of freshman and sophomore studies, like anatomy, chemistry and some others especially, will have passed out of mind, though it is even more to be expected that a fair knowledge of those subjects will be retained.

The task of the examiner, then, is not to find out just what proportion of the whole contents of text books the young men have been able to retain in their memories, that might be little more than clerical work, but the questions should be framed and the answers read with a view to find out whether the candidates have digested and assimilated in their minds such a knowledge of the various subjects as to make them intelligent and safe practitioners, and due allowance must also be made for the different modes of instruction, different points of view, and different or even contrary opinions of instructors in the various schools.

To make such an examination as that and judge its result with entire fairness, justice and wisdom requires a broad knowledge, a tolerant spirit, quick intuition, and well balanced judgment.

The law in this state makes it the duty of the state board to

"Make rules or regulations to establish a uniform and reasonable standard of educational requirements to be observed by dental schools," and gives the board power to "determine the reputability of those by reference to their compliance with said rules and regulations."

This duty is only second in importance to that of examining candidates for licenses, and in these two functions are comprised the principal part of their official duties, all other requirements being secondary or incidental and comparatively of less importance. The opportunity of state boards of the several states to consult and cooperate through the National Association of Dental Examiners for the establishment of uniform standards so far as the variations in the different laws will permit, and to bring about as rapidly as possible reciprocity in recognition by state boards of licenses issued in the other states, is important enough, but it is extra official and not imposed upon them by law.

Dr. T. W. Pritchett, Whitehall:

Dr. Taylor's paper is characteristic of the man—brimful of hope, patience, and "good fellowship," of course. Its general trend looks to future steady and continued advancement of the profession as a whole, by requiring of those now and hereafter seeking to enter the profession a higher scholastic and special professional education and training than has heretofore prevailed. While aware that this is a trite observation, it may be well to always bear in mind that it is upon this idea that the whole foundation and superstructure of the law depends for the compulsory and restrictive powers granted to its agents. The power is within certain limits given to the board of dental examiners. The duty is mandatory upon them to make rules or regulations to establish a standard of educational requirements to be observed by the dental schools; and to determine the reputability of said schools by their compliance with said rules or regulations. It follows that the board must make standards or rules for examining and passing upon the product created by the law. There being several classes of persons denominated in the law whose professional preparation and training can not have been obtained from the same sources, it is obvious that one standard can not be used to measure the fitness and capacity of all.

The crux of the whole question of the "duties and obligations of the dental board" relates to two things chiefly, viz., the supervision of schools, and the examination of all who are eligible to examination, in fulfilling the "letter and spirit, and purposes" for which the law was intended. The essayist seems to have passed rather lightly in detail over some of this—the omission possibly being designed to entice "some one to rush in where angels fear to tread." If he denies this, I will of course—forgive him, having no great reputation as a "rusher" myself. I will venture, however, to assert that in view of the very large discretionary and undefined powers accorded to the boards by the decisions of courts, their responsibilities are indeed very great because of their control over the destinies of many men and women.

The sole purpose of the examinations is to ascertain the qualification and fitness of the candidates. Men and women differ widely in ability of acquirement in limited or unlimited time, differing also in trying situations in ability to express and show well the acquirements they really have, together with many other things I have not named—all tending to make it difficult to establish a *passing standard* that will be just and fair to all parties concerned. The limited time allowed and the small number and variety of operations that can be undertaken and completed makes it hard to compare and judge correctly between those who luckily get the easier tasks, and those who unluckily get the harder tasks.

The deduction I wish to make from these observations, involving so many varying conditions and circumstances is, that a board must necessarily use a great deal of latitude and discrimination in its judgments and findings.

And now something must be said about reciprocity between the states, which term means, I believe, according to some interpretations, "once a dentist always a dentist." Nearly all the states in their first attempts at regulating the practice of dentistry by law exempted the graduate from examination for a license, and imposed no serious hardship upon any one with such a credential in going to another state and obtaining a license to practice therein. The fee for registration being almost nominal, and with no risk of being "turned back" by a state board, provided only that his diploma was issued by an accredited school. This practically was reciprocity of a liberal character, and it is doubtful if a better and more satisfactory scheme can be devised from the viewpoint of its beneficiaries. Some of the states became dissatisfied with this arrangement and changed their dental laws, making them more restrictive. Now, when an applicant with a diploma applies for a license to practice dentistry (if I may be allowed to personify a state), he is told something like the following: "I don't know about your school. It may be a very good one. You may be a very good practitioner of dentistry. You may be a 'has been.' Show me. You may be fresh from a dental school. I want to know what you were taught, and I want to know what you know about it before you abide with me. I don't know even about the schools of my own state. Show me. There is my board of examiners. I made it. It knows all about these things. It will measure you for all you are worth. What it says *goes.*" Illinois now says the same things here personified, since the adoption of the law of 1905—a "knock out blow" at every semblance of reciprocity as it was, adding enormously to the "duties, obligations," and responsibilities of the board, and it looks like retrogression. Like some perennial "old sport" who has been knocked down and counted out, but not killed outright, but still dazed and groggy—*reciprocity* is again shouting an appeal for another chance to win. A portent is coming from the East giving encouragement and hope for a renewal of the contest, and if the victory be won with the slogan, "Once a dentist always a dentist," let its effects be universal and incontestable for all our states and territories!

Dr. T. E. Powell:

Dr. Taylor is to be congratulated on the thorough paper which he has read to the society. It shows that he is very familiar with his duties as a member of the state board. Illinois is to be congratulated on the excellent timber in the members of the state board, for their high efficiency as dentists, and their estimable qualities as men.

Dr. Taylor's ideas as to the duties of the state board give evidence of high ideals of what should be required of men who are to be admitted to practice in this state, and while his ideals are high, as to the duty of members of the state board, we admire his modesty when speaking of the powers of the state board. He thinks that every man's duty in life is to labor, to give service, and to love. We can best fulfill this ideal if the laws of the state are such as to make it unnecessary to waste our energy in fighting. The object of all is to regulate conduct so that every man shall be free to exercise his right of health, liberty and the pursuit of happiness, and if the state law regulating the practice of dentistry is so constructed as to bring out the largest amount of efficiency with the least amount of friction, it is then indeed a good law.

It has not been so very long since the ideal of some of our colleges was to turn out men; no matter about the efficiency, number was the ideal. But competition and the demand on the part of the student that he be fitted to practice his profession in a skillful manner have brought about a gradual evolution, until now the average college curriculum, if properly mastered, means very positive efficiency.

Now, this state board has come into existence for the purpose of examining men graduated by the colleges to ascertain their fitness before permitting them to be turned loose on the people, and my opinion is that it is not for this board to say that a man shall have attended or graduated from any institution, but that it shall have high requirements, and insist that every man be able to prove his efficiency before the board no matter where this has been attained. We have not reached the high ideals that exist in some of the European countries, which require every man to attend school for a definite number of years; and until we have reached that ideal it would be unjust to force men in one line of life work to attend school and not making the same requirement in other lines. It should be our aim as citizens to bring our institution called the state up to that point where it may educate its citizens for every department of life work. When we have reached that ideal, every man who wills may become a professional man, if his abilities tend in that direction. And no man can possibly become a professional man who does not show the natural fitness for such work. In our public schools at the present time many so-called fads seem to bring out special talent, so that the teachers and parents know at a very early period in the child's advancement just the kind of work he should do. And when our state educational institutions have risen to the point where the state has its eye, so to speak, on the work being done by each child, then it will be possible to bring not only the professions to a very high state of efficiency, but work in general, instead of being a drudge, may become a pleasure. Then

Dr. Taylor's idea, that financial interest should be removed, will be possible of attainment. Reciprocity between the several states can not be attained until we have a national reciprocal assembly. In my opinion, this assembly should be composed of men elected as delegates from the state meetings by the members of the state societies, and not necessarily belonging to the state boards. These men should have superior professional knowledge, combined with general knowledge and culture, with great breadth of mind, enabling them to see all questions from their larger aspects rather than from the selfish one of professional interest. And then, when the requirements are published from each state board, it will command the respect of the profession generally and the public.

Dr. C. R. E. Koch, Chicago:

If I may be permitted before entering upon the discussion of this paper, I would like to make a statement which may be called the report of a committee on legislation and appointments on the dental board.

The society was good enough to appoint me a year ago chairman of the committtee on legislation and on appointments on the board, with Drs. Lawrance of Lincoln and Ritter of Charleston as my associates. You will remember that when our society adjourned last year the passage of the dental law of 1905, of which we are all so proud, and which I feel reflects credit upon the intelligence of the state of Illinois, was in doubt. Your committee went to Springfield, and was there in the final struggle which resulted in its passage. There was serious opposition developed, and although the governor was friendly to the bill, the opposition was so strong that he felt it his duty to the citizens of the state to withhold approval of the new law until he could get further light upon it. A distinguished member of the house represented the opposition in an argument before the governor. Your committee, with a number of gentlemen of the profession and outside of it, were present and replied. The result was that the governor, after due consideration, approved and affixed his signature to the bill, which made it a law, and that ended our work as your legislative committee. But there was another title tacked onto us, and that was the "Committee on Appointments to the Board." With reference to that, our committee desires that this assembly and the members of the society shall have an absolutely clear understanding. I beg to assure you that there is not a member of that committee now, and I hope there never will be a member of a committee of that kind who assumes the role of office broker, or assumes to be a man, or a group of men, who are entrusted with being the boss of the state of Illinois with reference to appointments. We conceived ourselves to be the accredited representatives to the governor of this state to represent this society, if he saw fit to consult us with reference to whom he might wish to appoint on the board and to get such light as we might give from a professional standpoint, with reference to the fitness of candidates, before their appointment. With that view in our minds we called upon his excellency; we explained to him the great desire of this body, after having struggled for the new law, that the men who should be appointed to execute it should be in full sympathy with the aspirations, hopes and desires of the dental profession, which were after all not selfish hopes and desires, but which were in the best interests of the public health of the people of Illinois. And with that understanding we tendered our services in case he should wish our advice with reference to the professional standing of gentlemen who might apply to him for appointment, or who might be recommended to him for appointment to the vacancies then existing and hereafter to exist.

I take great pleasure in informing you that the governor accepted the situation very gracefully and very thoughtfully, and said he should appreciate our advice and counsel when it became necessary, and that he would not make any appointments without first submitting the names of possible candidates for our opinions, and that he has done. We have not named a single man for appointment to the board. Names have been submitted to us of men who either had been recommended or asked for appointments, and we have simply said, this man would give satisfaction to the state, or that man is not in sympathy with the higher ideals of the profession. There the work has been left. The governor has made no change. I do not know that I am betraying any confidence when I say that he told us he would follow the example of his predecessor and allow each man to serve out his term. On the first of July there will be three vacancies on the board, and I hope when the governor comes to fill them he will fill them with the same kind of representative gentlemen as are now serving on the board. I think that completes the report of my committee.

Now, Mr. President, I would like to take up the discussion of the paper read by my friend, Dr. Taylor. To say to you honestly that I am surprised and disappointed in it, does not fully express my views. It was in the beginning largely axiomatic and academic. It was full of what ought to be rather than what is. It was a desire for things that we have not and we all should live for if we can secure them; but in the language of a distinguished ex-President of the United States, "it is a condition we have before us, and not a theory." We must accept the condition as it is.

In the past what has the dental law done for the state of Illinois? What has it done for this country and for the people? Gentlemen, twenty years ago, when I was so unfortunate as to be a member of the state board, we had no practitioners in Illinois to speak of who were graduates of dental schools. You will be surprised when I tell you that the total number of graduates of dental schools among the practitioners of the state of Illinois was less than 4 per cent twenty-five years ago. Examinations by dental boards came in,—feebly, experimentally. But they grew, and gradually the applicants for admission to dental practice found that the questions that were asked were beyond them, and they found the best and easiest way to prepare themselves to answer the simple questions was to go to the schools where dentistry was taught. The result was and is that at the present day (I am talking now upon information I received yesterday from the secretary of the board) there have been but six men examined in eight years who were not graduates from dental schools. I ask you in all fairness whether dental legislation of old, such as we had, poor as it was, has done anything to uplift the dental profession in its educational standard; whether it has done anything by reason of that fact to give to the people better service? The question is raised, Why should the people interfere with my business as a dentist? Why should I be compelled to submit to an examination when I paid out my money for an education? Well, there are several reasons. I want you to please bear in mind that the professional man who submits to the test of his capacity, when he gets through with it, gets the underwriting of the people of the state. He has something that no other business man has.

His capital is insured at the start. It is proof of his ability, and he can never lose his capital afterward. Years ago, when I was younger, and when I was more of a democrat than I am now, I used to say, what difference does it make where a man gets his knowledge so long as he has it? That is my theoretical opinion today, but it is not possible of practical execution. The government of the United States in its marine hospital service, in its army service, and in its navy service, when a man comes up for an appointment in the medical department, or even in the dental department as it is today, says to him, "Are you a graduate of a reputable school? Mind you, I say reputable, and the government judges as to whether the school is reputable or not. Where are your papers? You must be examined. Is it fair to suppose that what the government of the United States does for the protection of its soldiers, for its employés, is not a fair test to submit by the people for the benefit and security of their children and themselves?

It has been suggested that the matter of all education should be left to the educational department of each state or to the general government. I say Amen to that; but it does not do it. We were told in Buffalo, at the National Association of Dental Faculties, that it is the duty of the superintendent of public instruction of the state of Illinois to satisfy himself and to report upon all educational institutions. At the time I contradicted that statement. I came to Springfield and visited the office of the attorney general in quest of information, also the office of the superintendent of public instruction, who both informed me that the state of Illinois absolutely has no control of higher education or professional education. And we all remember a few years ago when the state undertook to work the little red school house operation, what the result was, and what the revulsion of feeling was among the people. The people are not ready for it. We do not have at this time the possibility of general higher public educational control by the state. Why? There is an institution in Chicago that is nameless which issues diplomas for anything you may wish for. It is located somewhere on the West Side. The president, the dean, the secretary, the janitor, and the engineer are all the same person. That institution has made a report to the superintendent of public instruction, and if anybody inquired about its standing they would say it exists as a legal institution. Strange to say, if from the same gauge one of the great universities was measured they would say "we have no report." These are the educational conditions, and that is what we find.

The people, so far as dentistry, medicine and pharmacy are concerned, have established and created special boards to take cognizance of those features of our professional education, and the courts have sustained the wisdom and justice of this arrangement.

The question is raised, Should the state of Illinois prescribe a standard which constitutes a reputable dental school? Now, gentlemen, since the law of 1881 the state of Illinois has always done that, only it has stated it in a different form. It is stated in the old law that a graduate from a "reputable" school may receive a license without an examination. But the meat in the nut was the word "reputable," and our state boards had lots of trouble and were mandamused up and down because they said certain schools were not "reputable." The present law is the result of the evolution and the experience of the last twenty years.

Personally, I started in, in the first place, as a citizen of the state of Illinois, working for the interests of the people. Later I became identified as a member of the state board and viewed the matter from that standpoint. Now I am occupying a position connected with a dental educational institution, and I am sure that my views have not changed. The three interests are the same. The schools, the profession, the people, all have a common interest, and just so far as we recognize that fact and keep uppermost in our minds the people's interest, we are not going far astray.

We talk about reciprocity, gentlemen. I am not more of an optimist than most of us ought to be. I am over the medium time of life, but I shall be here to rejoice with you over the fact that other state boards will say, "Thus says the state board of Illinois, the man has passed its scrutiny; go on thou and work here under the same law." (Applause.) And the seed for that thing is sown in the Clark dental bill. Supposing a well known practitioner of dentistry from another state should apply to the state board of Illinois for a license to practice, as, for instance, Dr. Truman; the state board has the power to give an oral examination, and it has the power to say what that examination shall be. I apprehend they would say, Are you Dr. Truman? We have known you so long by reputation.

Should he say "yes," they would say, here is your license. That is near to reciprocity. You could not have done that under the old law. I fear that we do not understand each other fully, and the scope of the new law is not fully understood. It is new, but we are already having the fruits of it.

I understand the state board has been assailed for the rules it has made. I simply want to call your attention to the fact that the rules of the state board of dental examiners in our state are excerpts and extracts from the rules of the National Association of Dental Faculties, and the board has simply taken this position, I imagine: "Gentlemen, you have put up the standard of what is necessary to constitute a good dental school. We accept your standard. All we ask you is to live up to it. That is your standard. Will you live up to it?" If you say, "Yes," then the board will say, "We will recognize you."

I want to call attention to the fact that there has been a suggestion made that the graduates of dental schools have failed to pass state boards in many instances and that a certain percentage of failures has been published. The organization that published such a statement did so without reliable data, and it was intended for the information of the members of that association alone, and a statement was published with it that the data were suggestive only and by no means conclusive.

The supreme court of the state of Illinois, fortunately for us, has decided the constitutionality of the new law, and in doing so has rendered several decisions of interest to the profession which I will try and set forth briefly.

In the first place, in a case brought down from Will county the point was raised that the burden of proof rested with the state to show that a man is guilty of practice in violation of law. The supreme court has decided that when one is accused of being an illegal practitioner, it devolves upon him to prove that he is not.

It was also insisted that the act of July 1, 1905, contravenes sections 1 and 2 of article 2, and section 22 of article 4, of the constitution of the state of Illinois, and section 1 of article 14 of amendment to the constitution of the United States. The supreme court says "that legislation prescribing regulations for securing the admission of qualified persons to professions and callings demanding special skill is within the valid exercise of the police power of the state is not a mooted question, and that the practice of dental surgery requires special skill and training will not be denied by any one. * * * The legislature had the power to prescribe what qualifications would be required of those desiring to practice dentistry in this state and in what manner those qualifications should be determined."

Section 4 of the act of 1905 was attacked because it confers on the state board of dental examiners the unlimited right to determine the reputability of all dental schools, colleges and departments of universities from which a diploma will be accepted; that it grants them arbitrary powers and that said board may establish unreasonable rules and regulations. The court says we can not presume that the powers granted by said section 4 will be abused or the law disobeyed. If the discretionary powers granted by said section are exercised unreasonably or with manifest injustice, the person aggrieved has recourse to the courts. No arbitrary powers are granted. The enactments require the rules to be reasonable.

Section 5 was assailed because it permits regularly licensed physicians or surgeons to extract teeth and it permits students to perform dental operations under the supervision of competent instructors within a school or college recognized as reputable by the Illinois state board of dental examiners. This was assailed as class legislation; the supreme court says, "That the reason for the exception of physicians and surgeons is obvious, and that it is not class legislation is too clear to require serious consideration." And with reference to the exception of students in dental schools, the supreme court says, "The purpose of this provision of the law is apparent. It is to permit only actual bona fide students the benefits of practical work under an instructor. But to prevent evasion of the law by persons practicing the profession under the pretense of being students, the act very properly defines who shall be regarded as students within the clause allowing them to perform operations or parts of operations. It is open to every student to bring himself within the definition. The reason for exempting students in reputable schools from the penalty prescribed by the act, that the public good and welfare are sufficiently protected by the fact that the student is at all times under the care, supervision and control of competent instructors."

Section 7 of the law was assailed because it gives to the board an unlimited right of discretion in granting of and revoking of licenses to practice dentistry. The court held, inasmuch as the party before it "has not had any certificate revoked, has never received a certificate or been licensed to practice, and if in this particular the act could be regarded as unconstitutional, we would not hold the entire act for that reason to be void or to be so in so far as it bears upon the plaintiff in error."

It was also urged that under section 11 of the act the court had no power to commit the plaintiff to jail, there to remain until the fine and costs are fully paid. The court rules that section 14 of division 14 of the criminal code of Illinois, which is as follows, "When a fine is inflicted, the court may order, as a part of the judgment, that the offender be committed to jail, there to remain until the fine and costs are fully paid, or he is discharged according to law. This is a general statutory provision and applies to the convictions under the statute here under consideration," and the court then unanimously confirmed the judgment of the court below.

Having this decision before us, I simply want to say: Let us not quibble about the rights or faults of the board, the rights or faults of schools or colleges, or the rights or faults of the profession. Let us bear in mind at all times the rights and the benefits belonging to the general public and let us all unite in sustaining this law and every other similar law in every state, and we shall have reciprocity coming before we know it. (Applause.)

Dr. Don M. Gallie, of Chicago:

The discussion this afternoon has been directed toward Illinois. The duties and obligations of dental examiners are not confined to the member of the State Board of Illinois, but to the various State Boards of the country. So we should look at this question from a broader standpoint. It is one that interests us all. We are desirous that harmony be brought about between the State boards and dental colleges, so that the interests of the profession and the interests of all concerned will be advanced.

The statement was made, if I remember rightly, that it is doubtful whether some students would get through the dental colleges if the personal equation and financial features were cut out. As I and others interpret that, it means that unless some students paid the price they would not get their diplomas. That does not look right, and if you consider the efforts that every college is making today to get men who will do the best possible for students, it does not seem to me that statement holds good. It may be there are some schools whose students get through because the personal equation and the question of finance cut an important figure. But we must remember that some examining boards are open to the same suspicion.

Dr. Taylor said in his paper it is doubtful whether there is any school that gives a complete and satisfactory course. He told me what he meant by that is, that our schools are not giving courses that some of our boards consider satisfactory. They are disposed to insist on some subjects not covered and greater thoroughness in some others. But are all boards (and I am speaking as an ex-member of the State Board) competent to judge of the fitness of a student, and are they the best ones to judge? Or, are the men who are doing conscientious work in the schools better fitted to examine them? Let me cite an illustration:

We had a man from this State go to Arizona. He was one of the best dentists we had. He had peculiarities, but he was one of the best students that ever went out of Chicago. He was plucked twice by the Arizona Board; yet three of the five members of that board had never been inside a dental college.

Another man went from Illinois to the Dakotas. He was at one time superintendent of a dental college infirmary in Chicago, and one of the best clinicians in the State of Illinois. He went before the board and was plucked in operative dentistry, a department in which he excelled.

Another man from Wisconsin, ex-president of the Wisconsin State Dental Society, who had given clinics in Illinois and all over the country, went to Idaho, appeared before the board, was examined and plucked three times.

I ask, do the members of State Boards live up to the duties and obligations imposed upon them? Are they more fit to judge of the fitness or qualifications of men than the schools who have had them in hand and who know their little weaknesses and know also their good and strong points?

The serious aspect of the case, it seems to me, is that the schools and State Boards are not getting together as they should with a view to settling these questions. To settle them we must get together, and both sides must be somewhat yielding.

We have in Chicago three dental schools, and I believe every school in Chicago is doing its best to turn out competent men to practice dentistry. We know something about our timber; we know that some men who are behind in certain studies, if they are given time and receive encouragement, will come out all right. But the boys in our colleges today are scared to death, so to speak. Why? Because they say, we have to be examined at the college; we stand the crucial test, and then we have to wait around for weeks, perhaps already financially broke, to be examined by the State Board, and we are hardly fit to go through this second ordeal. Now, I believe if the colleges and State Boards could get together and adopt some method by which graduates can take one examination satisfactorily to all concerned, much good would be accomplished. But the question does not refer particularly to Illinois, because we have men on the State Board here who will judge fairly whether a candidate is fit or unfit. We have men who show promise of a future, but who at the end of their college course are not experts, and may not be for some time, and the board must use judgment, and they must look out for those men in whom there is hope of advancement. Some men in a new environment among strangers will fall down. Will the board make allowance for them?

If there is a stronger argument needed in support of the contention that the dental schools are doing their best, will you just look at the clinic this morning and those that are to follow? The young men are giving the clinics who have only been out two years from school. They are displaying great skill. They are taking the lead. If there are a few weak students who are not up to the standard, ascertain something about the record they have made and make some allowance for them. If you are going to be so uncompromising as not to make some allowance for them, many of them will be judged unfairly. The duties and obligations of the State Board are not simply to ruthlessly cut men down, but to size them up in a fair and impartial manner, and I believe the State Board of Illinois is going to do that. That is not true of all boards.

Dr. G. V. Black, of Chicago:

I want to speak a word for the membership of the State Boards of Examiners of this country. I have watched the progress of the work of Examining Boards from the beginning. I have watched them pretty carefully. I know there are many men appointed on boards that have not been graduates of dental schools. In the beginning that was a necessity, and in some localities it may be a necessity yet. Furthermore, many of these men have made for themselves reputations that are better than a diploma. (Cries of good and applause.) Betterment in the work of examining has been made steadily from year to year. The lists of questions for the last two or three years are far better than they were ten years ago. This improvement is going on all over this country. It was to be expected in the beginning that students would find some awkward questions. It is to be expected now that students going out from our schools will find questions so worded that they will fail to understand them. Such have cropped out in the lists of questions in the last three or four years, but they are growing fewer and fewer.

Now, gentlemen, I do not think that we as school men have any reason to quarrel with State Boards if they ask some questions that we may consider mistakes. They may consider some of the things we teach as mistakes, and they may have pretty good ground for doing it. The whole profession from the youngest to the oldest should unite in supporting not only our own State Board, but the State Boards of the country, so far as they are acting honestly in carrying out the purposes for which they have been appointed. That we have had some scamps appointed goes without saying; that we may have some in the future goes without saying; but let us not find fault with the whole body of State Boards because of this. Let us not find fault with State Boards because some men have been appointed who have not been to dental schools, for these may prove to be the best men. There may be, and will be sometimes, men appointed for political purposes. but in the last few years we have found that these are working well on the boards for the best interests of the dental profession and of the people, and let us not forget, above all things, that the object of this law and of the other laws is the benefit of the people whom we serve. (Applause.)

Dr. J. G. Reid, of Chicago:

I would like to say a word in this connection and correct a statement that Dr. Gallie has made about certain men going before State Boards. The gentleman whom he referred to as having gone to the

Dakotas and failed to pass in operative dentistry did not fail in any of his practical knowledge, but he totally failed in histology. He did not answer one question in that branch. I make that correction.

Another thing: I have heard the matter brought up of people going from one State to another, especially, we will say, California, Arizona, the State of Washington, some of the Western States where the altitude is high, for healthful purposes. Those States may be putting up the bars, so that it seems unjust to men who go there; but we must bear in mind that men are going to those States for health. What is it? They are "lungers," men with tuberculosis. These boards owe it to the citizens of their State to give them such protection as they can against tuberculous pratitioners, and they are making examinations difficult for these reasons.

Dr. P. T. Diamond, of Chicago:

The paper of Dr. Taylor has brought out some interesting points. Physical disabilities of applicants for admission to dental colleges have been referred to and should disqualify an applicant as well as lack of preliminary education. A lot of these unfortunate consumptives Dr. Reid speaks of would not be able to get into the dental profession and later have to move to a more favorable climate if they were examined carefully before entering the colleges. None of them are admitted into the army dental corps, because of the strict physical requirements.

The preliminary educational requirements of dental and medical schools are not the same in this State, although they should be. For instance, students will take a year in a dental school where the requirements for admission are two years of high school, then change over to the medical college the next year, receiving a year's credit, and so evade the preliminary educational requirement of the medical schools. The dental schools exact only three years of preliminary high-school study before entrance, previous to this only two years was required. The medical and dental matriculants should both be graduates of a high school and find no loophole of getting around it, but some of the medical colleges present such openings.

I am going to offer a resolution bearing on this question. I have been trying to find a way whereby we can dispose of illegal practitioners in the dental profession, because the State Board says they can do nothing. These men are not supposed to be illegal, but some of them really are, because they obtained their licenses from Dr. Smyster, then secretary of the State Board, in an illegal manner. Men attempting to enter the three reputable schools of Chicago were turned down because they were without preliminary qualifications from Germany, so they went to Dr. Smyser and he sent them to Huxmann. They went to the Huxmann school (the German-American dental college, which the courts have since closed up), and at the end of a short time, three weeks in some instances, they were given diplomas. In turn they went to Dr. Smyser and got their licenses, being examined in German, which was translated by Huxmann or his representative. Now, to make themselves reputable, these graduated (?) men have, most of them, entered what might be called the fake medical schools of Chicago, though the State Board of Medical Examiners recognizes them. When these men get through, they can enter the Chicago Medical Society, if they desire to do so. I know this because I am a member of that body and know they will be admitted unless something is done to stop it. In that way they can become members of the American Medical Association and then appear very reputable.

If the State Board of Dental Examiners would notify the Board of Medical Examiners that these men should not be recognized and give the reasons why, they would not be able to enter the medical schools. They should be listed right away as unqualified to become reputable.

I am going to offer a resolution and ask the Legislative Comcommittee appointed by this body to look into this matter and notify the Illinois State Medical Society of the real standing of these men—that such men are on the black list, though they have obtained licenses. In that way they can see who they are beforehand and refuse them admittance to a medical college or the medical societies. (Seconded and referred to the Executive Council.)

Dr. Taylor (closing the discussion):

There have been a number of points raised which I would like to have the time to take up and make plain. It is possible that I have been misunderstood. I tried to talk about general principles and about the educational interests in the United States, and not simply those as applied to Illinois. There are fifty or more dental colleges in the United States. I heard a man say today, that ten of them are doing excellent work. He said the good ones can be named on the fingers of the hands. The three dental colleges in Chicago are included in this list. But I am not talking particularly about Chicago. I am trying to be impersonal and general.

I am glad that Dr. Noyes does not feel like Dr. Ottolengui, the editor of *Items of Interest,* who thinks that the Illinois Board of Dental Examiners has rules that are unfair, and everything of the kind. They are the rules that have been adopted by the National Association of Dental Faculties of the United States, and we have simply said, gentlemen, what you have adopted yourselves you have got to live up to, so far as the Illinois State Board of Dental Examiners is concerned. Dr. Noyes agrees with that proposition.

As to the education given in our colleges, let me say right here that what I have said about the colleges, I have likewise said about State Boards. I hope I was not understood as talking about any graft in our colleges or in the boards, as that was furthest from my mind.

Can a student be taken by Dr. Noyes or Dr. Black, or the best man we have in the State of Illinois today, and educated as a dentist? He can not be. He can go to Dr. Noyes' school or to some other school, and receive instructions from members of the faculty, but they can not instruct him in their offices. I hope a broader view of dental education than can be obtained in a dental college will be taken, and that the college education can be supplemented by experience in an office. I believe that condition will finally come, but we do not need to agitate that question, only in the way of facing the future and considering a condition that ought to be.

As to granting diplomas, I would like to give Dr. Noyes and others a few figures, did time permit, in reference to the granting of diplomas in high schools, from scholastic schools, and from professional schools all over the country. If you keep your eyes open, you know that people are passed out of high schools because it is for the public interest not to have them kept there any longer, and diplomas are given them. They are passed out of our colleges in the same way, particularly our medical colleges. They are passed out of medical colleges by the wholesale. I am not making this statement from hearsay, but from an address delivered by Dr. Billings, of Chicago, president of the American Medical Association, at its meeting held in

New Orleans three or four years ago, and if you will read Dr. Billings' address, you will find that the dental profession is in excellent condition today as compared with the medical profession. There are a good many ways to whip the devil around the bush, as Dr. Diamond has told you. I believe the better dental colleges will work in harmony with our State Boards all over the country.

I do not like to differ from Dr. Pritchett. He is pessimistic in regard to reciprocity, so far as the new law is concerned. I believe the State Board has the power and has the spirit of reciprocity, and when you get the spirit you are all right to advance the interest of reciprocity in one State.

The American ideal of life, gentlemen, is not to ask, who is your father or what college did you graduate from? Our ideal is to ask, what can you do? What do you know? And when a man says, I know this, I can do that, and I can demonstrate to you that I can do it, then we should give that man a right to be examined. That is what I am standing for. Suppose Abraham Lincoln could not have been President of the United States unless he had a college diploma! From every hamlet in the United States—yea, in the world—out of the depths of life rise up men who rise above their fellows. They rise without the blessings of pope or king. No one can control that dignity, that power, that spirit in them, and shall we deny any man who shows himself capable the opportunity to be and to do because he has not a diploma from some college? No. Shall we require him to go through some set groove to attain manhood? No. Let us make it possible for men who can not get into these institutions of learning to help themselves over difficulties, if possible. Give them the opportunity to come before the State Board and say, I am willing to submit to your examination, and if I can not stand your tests, do not give me a license. If I can, I ask it as a man, as an American citizen I demand it, and the courts ought to sustain him in that demand. (Applause.) Colleges are great things, but at the best they are only aids, making it easier for men to grow.

I want to say in reference to the report of Dr. Koch's committee, and in reference to the Illinois State Board of Dental Examiners, the best thing that ever occurred in the State of Illinois to dentistry was when Governor Richard Yates vetoed the bill he did veto. (Applause.) Why? Because it finally gave us a law that has stood the test of the Supreme Court, and the other law, as sure as you live, would not have stood that test, because one of the best attorney-generals in the State of Illinois passed his judgment to that effect on the clause which Governor Yates said was unconstitutional. We have a law that has stood the test of the Supreme Court, and has been vindicated in every particular. A better thing than the law is the fact that we have in the Illinois State Dental Society about thirteen or fourteen hundred members, whereas, before reorganization we only had two or three hundred. It has made us a factor in the politics of the State. We can go and say to politicians, gentlemen, in behalf of the people of the State of Illinois, we want certain things. The politician may ask, how many votes have you? When we tell him that we have thirteen hundred, and that we are allied with the physicians, who have three or four thousand members, and are pretty closely associated with the pharmacists and nurses, I tell you we will be an important factor in the State politics.

I had something to say about that unmentionable school in Chicago, but it was so unmentionable that I can not think of it now, anyway. (Laughter.) One of the strong points made by Dr. Koch against my paper, I believe, is the strongest point I am contending for. The United States demands, what? It demands of its men to kill others, that they be thoroughly educated. It demands the very best body, the very best intellect, and the best education it can possibly give these men. What does it do? It spends large sums of money to make fighting machines out of them to kill others. I hope in the future our Government will spend more time in educating men to be good citizens, rather than making fighting machines out of them. What I hope to see is that men shall be educated by the community, and I mean by that the State, to fill any avocation that the people demand, whether it is to dig a trench or to build a bridge, inspiring the people with high and noble ideas. I hope the people will think that it is not the man who gets the education who is simply being benefited, but all the community is being benefited by it, and the whole community is benefited as much as that individual, if not more, and the man can rise up step by step, as God has endowed him, and from digging a ditch he may rise to be President of the United States. But the man who digs a good ditch may be doing as noble a thing as being President of our country.

I wish to speak of the financial and personal factors. I did not say anything about the question of graft, but here is a fact, that men go to institutions that must be made to pay, institutions that are run as we run our dental offices for the money in it as a business. Our legislators would not sustain the Illinois State University unless the different departments were made to pay, very largely, the expenses of running them. They are no better than private institutions, or very little better, because it is a financial matter with them, and it is a question all the time whether a man can pay $300 or $400 for his tuition; and the sympathy of the professor is to let the man get through if there is a possibility for him to do so, and to get a diploma. (Applause.)

DISCUSSION OF DR. PERRY'S PAPER, ON "ROACH'S MOLDABLE PORCELAIN."

Dr. J. G. Reid, of Chicago:

The paper is a commendable one, because it is free from technicalities and has been presented to you in a way that any one can understand. I hope I may talk in the same way. Dr. Roach is to be commended for presenting this material to the profession. It was conceived in his mind, it was prepared, fused, and the first filling put in by Dr. Roach. I saw this in its infancy, and I know the work that has been imposed upon him to bring it to the perfection in which it is at the present time.

The indications for its use are many—just as many and probably more than the indications for a crown. He stated that this material was limited in the anterior part of the mouth to the distal surfaces of cuspids and the labial surfaces of incisors when concealed by the lip. I have some of this material in use on the lingual surfaces of central incisors and cuspids. We find many times where an inlay can be utilized in those places, and where the opaque porcelain fills the bill to perfection in lining the lingual surface of even central incisors and badly broken down cuspids with a reasonably good labial surface remaining intact.

As stated by the essayist, the man who has learned to properly prepare the cavity for the porcelain inlay has had the best teaching that could possibly be laid down for the introduction of a filling. If there has been any one thing that has been useful to the dentist in the preparation of cavities it has been that idea of the preparation required for the perfection of porcelain inlays. The trouble with the beginner concerning the porcelain now under consideration is that he is likely to make a failure by not cutting far enough. Don't be afraid to extend your cavity to reasonably good walls, because you can restore them easily and perfectly and securely with the porcelain. Therefore, do not hesitate to cut.

When the filling is placed in position and cemented you must bear in mind that the adaptation of it is so perfect that when cemented into place it becomes a solid mass. There is no unequal bearing in any portion of the cavity. Therefore, there is no danger from fracture of any particular portion of the remaining wall that is standing, providing it has been protected with the porcelain itself.

There is another class of cavities which was not mentioned by the essayist, and where this material fills the bill perfectly. I will speak now particularly of the bicuspids where the labial and lingual walls are standing alone, like two spines, if you please. You can cut those walls down say one-half, make your crown, restore the tooth to its natural contour and replace it into the cavity, and you have a beautifully finished piece of work. You don't have to crown with gold. This was not mentioned in the paper.

The new beginner must not forget this one thing, that in the preparation of his cavities he must prepare a cavity that the impression can be removed from. It is so sensitive to a little under-cut which may not be discovered, that when you come to remove the material from the cavity you may have trouble, unless the preparation of the cavity has been done carefully.

THE PRESIDENT:

Do you use a stone inside of the cavity to shape it instead of burs?

DR. REID:

You can use stones if you wish, but I use the finer burs that are employed for finishing. You can use stones where you can adapt them to the cavity, but don't allow very deep fissures to appear anywhere.

I want to speak a little about the employment of copper amalgam in making these fillings. We employ it for two reasons. One is that when put in proper shape for packing it can be securely packed, and a definite and sharp margin can always be obtained. The second reason is that the material can be used again and again. It does not become lost after once using. Copper amalgam has practically gone out of the market. About twenty years ago it was considerable of a craze. I remember that the first speech I made before the Illinois Dental Society was in Quincy, in 1882, about Sullivan's copper amalgam, and its use in cavities. Now it comes back for a new purpose. Perhaps, many of you are not acquainted with what copper amalgam is, or how to use it. It requires a good deal of skill to pack one of those cavities with it, and get good results. Have the copper amalgam put into the proper shape to pack into the cavities, and use small pointed instruments to pack in the fine lines, and then build up gradually, and pack well.

Dr. Perry and I can not agree on how to handle copper amalgam. He tells you to boil it in glycerine. I think that is the worst thing a man can do. I am not afraid of overheating it, but I heat one piece at a time. I don't take two or three pieces of different sizes and heat them on a spoon, because I then would spoil it. One of the best spoons to do that is an old, discarded mouth mirror. You have to learn to handle copper amalgam as well as this mouldable porcelain. If you have never handled it, you will make as many mistakes with it as you make with the inlays from the moldable material.

Now, in regard to the use of the material by the beginner. You will become discouraged. I will tell you that right now, and the best advice I could give to any one who expects to start to use this material is to buy a box and sit down with a couple or three models, and mold and mix and mold and mix until you have used it all up, and you will by that time have become familiar with the characteristics of the material. Dr. Perry can not tell you how to do it, and I can not tell you how to do it. We can only give you some of the details. You must become acquainted with its use before you can expect success.

Dr. George W. Haskins, Chicago:

Of all the modern innovations in dentistry, none has interested me more and few as much as the one which Dr. Perry has just presented us, in his usual able manner.

I object to the name porcelain as applied to this new material, and yet I am not prepared to offer a substitute for it. In nothing is it like a porcelain, except that it is subjected to heat to render it more solid. It is more of the nature of stone ware. Like that substance, it breaks with a fracture like stone, is strongest when not baked to a glaze and is opaque.

One might gather from the paper that the manipulation of this new filling material is easy, but, believe me, it is not. It requires patience and acquired skill to handle it, and this is best learned in the laboratory. The shaping of the cavity, the mixing, the molding and the baking all have to be done just right to get just right results. Now, after these discouraging remarks, let me add it is well worth all your trials and troubles.

With regard to the baking, Dr. Roach told me recently he was going to try to simplify it by so combining the ingredients that the proper fusing point would be that of gold, or some definite alloy. to those of us who do not use the Roach furnace this would be a great help. When properly fused, it is not glazed at all, for the glazing reduces its strength and destroys all the fine lines, with resulting change of shape and excessive shrinkage. If under-fused, it becomes hard to break and to grind, but it has not reached its maximum strength until baked sufficiently, so a drop of water placed upon it will not be absorbed, although in other respects it is exactly like the under-fused bake in appearance. The under-fuse having the power to absorb moisture would soon be filled with fluid from the mouth, while the proper bake, not being porous, would be free from this objection. And, finally, the great mass of the filling is made at the first molding, and it is desirable to have all that we can of the shrinkage take place at the first baking. This makes it possible to complete the filling with one, or, at the most, two more bakings.

As the practice of dentistry broadens, we are learning more and more to select a filling material best suited to the case in hand. We do not hear so much today of gentlemen who only use gold, or amalgam, or the cements in their practice. Each has its best place, and this material has its best place, where nothing else will do as well. Certain shapes of cavities require grinding the first bake before it will go back into the cavity; this is particularly so in those cavities consisting of combinations of mesial, distal and grinding surfaces.

The essayist has well stated the indications for its use, but one in particular I would like to emphasize. Several cases have come to me lately, and you all have them. A molar, with crown and one or more sides missing, pulp alive, but so easily irritated that nothing but gutta percha will keep it comfortable; nothing in the past could be done in the nature of radical treatment without extirpation of the pulp, but today, by means of this material, it may be filled permanently, and by reason of the low power of thermal conductivity such source of irritation is immediately corrected. Or, in a similar case, with the additional item of the pulp gone, here it is either crown, inlay or amalgam; the last is the poorest of all. None of you think more highly of a well made crown than I do, and yet I would only use it when nothing else would do. And while here and there through this audience are gentlemen who can make a well fitting inlay, most of us can not; but by far the largest part can, after acquiring the skill, serve our patients better with what Dr. Perry aptly terms a restoration with this material than with either of the methods mentioned.

If interproximal spaces are properly preserved, you have escaped the irritating effects of the band upon the gum margin, always to be noticed to a great or less degree. Many times in my practice, while filling with translucent porcelain pulpless bicuspids, when nothing was left but lingual and labial walls, and not too much of them, I have been tried by the excessive shrinkage of that material, and more tried still by having them come back broken and dislodged. In these cases, where habits of lip or size of mouth or covering mustache will conceal it, moldable porcelain is fully indicated, for it fills all other requirements for a filling material, except the one of color. Dr. Perry has advised you well as to the taking of the impression and subsequent filling of the same, and I can add little to it but a few dont's. And the first is, don't be satisfied with anything but a perfect impression, one which shows the edges of the cavity perfectly defined and, if possible, beyond them, and which is not warped from handling while it is still plastic. Don't spare any pains in filling it, for any fault in the resultant model will be in the nature of a depression, with a corresponding elevation upon the surface of the completed filling, but no depression in the tooth cavity for that elevation to fit into. In handling the modeling compound impression, remember that the heat of the fingers will in time soften it and permit a change of shape. Don't use compound but once; frequent heating changes its character. In taking impressions of a difficult cavity, it frequently happens that the compound will harden before you have forced it to place, and upon renewal the impression will be more or less imperfect. In such cases I replace the impression in the cavity while cold and soften it with heat from the chip blower. It can then be pressed home as you wish to. If the impression material is so confined that it can not go where it is easiest to go, but must go where it can, and it is soft enough and pressure enough is exerted you will get a perfect impression. Of the mixing and varying proportions of powder and fluid, I shall not speak, for I know too little about it. Dr. Roach will tell us all about that, and, after all has been said, it remains for the individual to acquire that knowledge through his own experience. Were translucent porcelain moldable and stronger, or moldable porcelain translucent and of better color, we would in either have the ideal inlay material, but, as it is, each has its place, which the other can not fill.

Dr. F. E. Roach, of Chicago:

In the beginning I want to commend very highly the paper presented by Dr. Perry. It is good orthodox teaching in regard to cavity preparation, and the subject of inlay cavity preparation in general.

It is very pleasant for me to know that the inlay work is being recognized as having added something to our work in cavity preparation, and in the practice of filling teeth generally. There is no question at all in my mind that the true principles of cavity preparation are founded on the sound mechanical principles as outlined by Dr. G. V. Black. There is not that variance in cavity preparation for inlays and for fillings that many seem to suppose. The chief point of distinction is that the inlay cavity must be free from under-cuts. The general principles of free excision, extension for prevention and retentive form in its modifications are practically the same, and while those of us who have been doing inlay work for a considerable length of time have been at variance, and are still at variance in our beliefs as to the principles of cavity preparation, we are getting closer and closer together.

As to the cavity preparation for this material, it does not differ in any particular from the cavity preparation of other inlays. You need not be afraid to cut away frail walls, because the larger your cavity the easier the construction of the inlay, and the stronger the material by reason of the greater bulk of porcelain.

The success of the work may be covered in a few words by saying, first of all, you must know cavity preparation and follow that up with good impressions and perfect manipulation of your models. I would say just here, however, that it is not always necessary to make models in the manipulation of this material. It may be molded readily in the mouth without the use of models. No better material is at hand at present for the impressions than the modeling compounds, if properly manipulated.

In regard to the bite, it is also essential that should be taken with care in order to get the best results.

I shall not dwell upon packing amalgam into the impression further than to say it will be an education to all of you, as it will show you the imperfections you are making daily in the use af amalgam for fillings.

I feel that I should explain how to properly bake the material. As the fusing point is below gold, it may be confusing to some to know how to bake the material unless they possess some form of pyrometer. It may be easily and accurately done by the time method. While this method is not entirely accurate in every instance, it is sufficiently so to get uniform results. The best method is to turn on the current with the lever on the first button until the furnace has become hot, as hot possibly as it will become at that point. Then place your work in, and I would say here, don't carry the material into the furnace at once. It should be dried out carefully and thoroughly before it is carried into the high heat. Otherwise you may have a blister. With the furnace heated on the first button you will then put the work into the furnace and close it and move the lever to the button at which you are going to bake, and time it from that time. In that way you will get accurate results.

As stated by Dr. Haskins, the material is at its maximum strength, and retains its form best at an under glaze. To determine this you will of necessity make a few trial bakes. When you take it out of the furnace it will appear rough, but that is no indication that it is under baked, and by placing a drop of water on it you can determine whether it will absorb the water. It will be readily polished with a disk, so that you will get a nice, glossy surface.

Dr. Perry made a statement in regard to the disintegration of the cement from the joint, intimating that he did not believe the cement would dissolve out of the joint from the margins of these fillings made with moldable porcelain.

DR. PERRY:

Not easily.

Dr. Roach:

I don't think you modified it in that way. By reason of the fact that there is a better union of the cement to the material there is, I think, a less tendency to disintegration. There is no matrix intervening as a blind, but you are fitting directly to the cavity, and for that reason you have a good fit.

As to the color, I know that it is a disappointment to the porcelain worker that the material is not translucent, and does not stand as a competitor in this respect of our translucent porcelains. It would be ideal if it were so, but we feel that it has other good qualities that counter-balance that objection, which is not a sufficient reason for condemning it. While the number of colors may be made numerous in cases where indicated, I think that the number will be necessarily limited.

A word of caution in the adaptation and use of this material. The other speakers, and the essayist have led you to believe that the material is very difficult to manipulate. It is tricky, and until you learn its peculiar characteristics you will be discouraged, and have a strong tendency to throw it aside and say it is worthless; but I think there is no doubt that you will find a place for it, and will easily master its peculiarities, and if it meets with your approval under its indications as outlined by the essayist, and serves the purpose as intended, I shall indeed be gratified.

In reply to a question as to whether it is not practicable to mold this material in the mouth, Dr. Roach said:

The elimination of the model is very frequently possible. In exterior cavities it may be molded direct to the tooth.

CHICAGO ODONTOGRAPHIC SOCIETY.

A. regular meeting was held April 17, 1906, with Dr. W. H. Taggart in the chair.

Papers were read by Dr. L. E. Custer, Dayton, Ohio; Mr. Hammond, New York City; Mr. Garhart, Indianapolis, and Dr. F. E. Roach, Chicago, on "The Dental Furnace."

DISCUSSION.

Dr. W. H Taggart:

When you chose me for your president, the first thing that came to my mind was to get the manufacturers and dentists together and have each tell the other what he knew about electric furnaces. These gentlemen were a little bit shy at first about coming, because they had an idea that we wanted to pump them and get their trade secrets, but we assured them that that was not the case, and told them that they would be as much benefited by this symposium as any one. But now that they are here we want them to know that they are here for the benefit of the dentists, and we want you to ply them with questions as to doubts in your mind regarding these furnaces.

One of the things suggested to me about the electric furnace is to show the dentists the limitations of that apparatus. There is no doubt but that some furnaces have been poor ones. The furnace would be used a few weeks and then something would happen to it. The dentist knowing nothing of electricity, and being careless in the handling of his furnace, immediately made a complaint. Go back to the time when we used a vulcanizer without an automatic cut-off. How often did you find the thermometer out of sight, turn off the gas and then run away for fear that the apparatus was at the point of exploding? The electric furnace in handled about the same way by the average dentist. If the porcelain has gone 5-6-700 degrees higher than it ought to bake, it shows that the resistance in the platinum wire, which is the source of the heat, has gone a thousand degrees higher than it ought to go. Consequently he has put a load on his furnace from which it will never recover. It always will be a weak furnace afterward, so that I feel that the meeting this evening will show the dentists that there are limitations to the electric furnace.

I have an illustration which will show that you can not expect an electric furnace to last always. This (showing a sample) is a section of the material which holds the platinum wire against the muffle, around which it is wound. You can see the course of the wire. With a glass you can see minute crystals of platinum that have been thrown off from the wire, showing that the excessive heat has disintegrated the platinum, making its caliber smaller and thus greatly weakening the furnace. The disintegrated particles are numerous enough to make the current leak across or short circuit as the furnace grows older. With these limitations of platinum we can not blame the manufacturer if he does not furnish us a furnace that will last forever.

Dr. Custer spoke of the looping of the wires. That was a suggestion that was made in the old Carpenter rheostat with the idea of protecting the wires. The natural tendency is for the center of the furnace to heat rapidly. If the center gets hotter, the ability of the platinum wire to carry the current is less. The hotter it gets the more the current is checked by making more friction and piling up the heat; so that the hottest part of the furnace keeps getting hotter, while the ends may be hundreds of degrees cooler than the center, throwing the greatest share of the load on the hottest wires, which are not in a condition to stand it so well. If right from the start you see it is getting hotter in the center than elsewhere, there is something wrong in the wiring of the furnace. So that an even temperature in your furnace is a good criterion in selecting a furnace.

Dr. Custer alluded to the fact that dentists have not the ability to test the poles. In the dynamo room they often change the poles. It does not make any difference with the light, and the dentist would not be in a position to know that.

Mr. Hammond spoke of the condition platinum wire seemed to be in after it had gone through the high heats, which really I have not experienced. I have found that the high grade of wire after it has gone through several thousand firings is as soft as lead. It is not of a crystalline nature, but soft. I do not know why that should be, except that I try to get materials which will not flux. It may be that the fire clays that he has used have caused that crystalline condition which he gets. A linen thread of the same diameter as the wire has as much crystalline condition as the wire. Probably the fire clay must be considered in this connection.

Mr. Hammond spoke of the continued use of the furnace for five or six hours a day for a number of weeks and months, but he did not speak of the influence that the turning on and off of the current has. Many have claimed that it has a decided influence; that the wire will keep up a continuous heat for weeks and would not last one-fourth as long if the current is turned in and out frequently.

In regard to the introduction of resistance into the electric furnace, I have had an idea that there are too many buttons, too many points, put into the resistance. I can not see any benefit in throwing a current into a wire gradually. Nearly all who use resistance say that it is detrimental to throw in the full 110 volts and a full number of amperes at one time; that it is better to let in a little heat at a time.

I have proved to my own satisfaction that that is not necessary. A platinum wire when cold is in the best possible condition to carry the current. It is strong and healthy. Throw the full current into the wire and it is perfectly able to stand it, because it is a cold wire and it can not get excessively hot until its surrounding material is heated up. It can not come to an excessive temperature, because of the close contact of the conducting materials that bind it to its side. The wire can not come to a thousand degrees until the investing material is up to 800 or 900 degrees. By throwing in the current gradually, when you come to the next to the last button the furnace is almost incandescent. You throw in the balance of the current when the wire is in the least physical condition to stand any more strain. It is the last straw that breaks the camel's back.

I had not been using an electric furnace for a month before I got on to the automatic feature of the cut-out. No matter how accurate a man is, there are degrees of accuracy in different men. One man pays attention to details, while another man does things "about right." The last man is always trying to do something else in the meantime. So I decided that the personal equation must be eliminated. The regulation should be done in an automatic way. It keeps the porcelain from being over-baked, because when once you have learned that a certain point in the automatic cut-out gives you the right bake of porcelain you should stick to it. The man who started out with a commercial furnace and did not have an automatic cut-out did not see the necessity for having one. Then the man gets a pyrometer attachment which tells you when you have a certain temperature, but even then you must keep your eye on your watch to see how long the heat must be held there.

I have a furnace that has baked 2,000 times, but I have used the automatic cut-out from the very beginning, consequently that furnace is able to stand 2,000 heatings because it has not been overloaded. A furnace never recovers from one overloading.

Dr. L. P. Haskell:

I have been using Dr. Custer's furnace since 1894, having purchased one of the first made, and have no reason to complain of it. Of course, all my work is continuous gum work. The only difficulty I have is to determine the fuse. When you consider that one eye is entirely blind and the other is defective with bifocal glasses over it, you can realize the difficulty I have to determine the fuse by sight.

That is my only trouble, and I certainly would not dispense with the electric furnace. I have used furnaces for sixty years; first the anthracite, then the coke, then the oil, and finally the electric. Beyond this we can not expect to go, except in further improvements.

Dr. Edmund Noyes:

It seems to be apparent, experimentally, that the baking point of porcelain is somewhat below the point to which we frequently run our furnaces. The porcelain would be better if we could run the furnace to the lowest heat necessary and maintain it there for some time without increasing it. A piece of meat is better if it is baked in an oven of the right heat than if baked in an oven which is growing continually hotter until the meat is baked.

Dr. C. M. Baldwin:

Furnaces having pyrometer attachments can be purchased, but many dentists have furnaces that are not equipped with such aids to accurate baking.

A simple, but accurate method can be used for baking in mica-door furnaces. A soapstone wall is placed between the porcelain and the door and a one-quarter gold cylinder is used to indicate the required temperature. The porcelain should receive the highest heat behind the wall, but the position for the gold varies as if on a scale between the side of the muffle and the end of the transverse wall. The gold is placed nearest the porcelain when comparatively low temperatures are sufficient, but the distance is gradually increased as higher temperatures are required. The melting of the gold indicates that the heat surrounding the porcelain is sufficient to fuse it, and the current is shut off. Baking thus by relative heat positions, both of which are within the muffle, the fluctuations of the electric current act upon both gold and porcelain alike, and influence the bake only as to the time required.

Dr. G. T. Banzet:

I use the rheostat because I have not been entirely satisfied with the automatic cut-out. I have tried to secure a constant temperature by securing a higher temperature than that desired and then reducing it on the rheostat. I secure very good results in that way, and I have thus been able to keep the temperature nearly constant.

I have been using porcelain for twelve or thirteen years. I place my assistant in front of the furnace to time it, and I have never, but once, in that time, overbaked the porcelain. I believe, however, that the automatic cut-out, when perfected, will be the correct thing, but it should not be regulated by a clock arrangement, but by the temperature within the muffle. And I also believe that the muffles constructed with the wires wound on the inside are more durable and better for the dentist as well as for the manufacturer.

Dr. H. N. Lancaster:

In several experiences of burning out, the circumstances attending each have met with the intuitive idea that it has been more a pulling apart of the wires than an actual burning out, and it has occurred to me that in all probability the time of the occurrence of this pulling apart has been in the cooling of the furnace after the current is cut off. The idea of the unequal contraction and expansion of the wires prompted me to ask this question: Whether the rapid cooling off of the furnace by means of cutting it off completely without the use of the rheostat is as safe as cooling it down gradually by means of the rheostat. Further, in the cutting off of the circuit by means of the switch, if the switch should be operated rapidly so as to produce a minimum arc or whether the arc should be allowed to continue for a time, gradually opening the jaws of the switch. I have been told that it is injurious to leave the arc burning, whereas it would appear that the creation of an arc, consuming as it does, a certain amount of current, would act as an additional coil to the rheostat.

Dr. L. E. Custer (closing the discussion on his part):

It occurs to me that if we will use carbon we will be more certain of contact. It has been my experience that two carbon contacts are much more certain to conduct the electric current than platinum, although platinum is used in electric work largely for that purpose, but in delicate work of this kind where you have so light a contact, nothing serves so well as two carbon points.

More buttons are merely a complication. The most efficient oven is one where when you have gotten the heat necessary for fusing you have turned all the current out of the rheostat, and it need not represent much resistance, only about one-fifth of the resistance of the oven and the rheostat together. I have always stood for but few contacts on the rheostat. I make it with from one to five buttons. These are all that are really needed for a perfectly working oven.

As to the automatic rheostat. The first oven I supplied Dr. Haskell had on it a clock with an arm which traveled around buttons on the dial wing the same as going from button to button on the rheostat. It was possible to lengthen the contact as the finger slid around according to the material you were using and thus vary the time of fusing on the last button. On the last button it was possible to give a little longer contact. When it reached that it slid off entirely and the current is cut off.

(Here followed a blackboard demonstration of a thermometer.)

Later on I made a larger thermometer with a wire running down into it, and the moment the mercury touched the wire, the bottom of the mercury being in contact with another wire sealed in, it rang a bell and the current could be shut off, if desired.

You will have a burn-out while heating and a break in the wire while cooling.

In regard to the prolonging of the arc. That probably accounts for the destruction seen in the last contact button. I can not see any advantage in it, but I can understand why complaints were made of an arc hanging so long on the last contact button.

Mr. Hammond (closing the discussion on his part):

Dr. Taggart says "that he does not use a rheostat," yet he spoke of the great length of platinum wire used in his furnace, which extra length of wire really constitutes a rheostat in the sense of absorbing the excess of current; but, having no power of control, the heat in the furnace will be greater or less according to fluctuations of the current.

As to throwing his full current in without damage, he does exactly what is done in a rheostat controlled furnace with resistance in; i. e., when the control lever is on a low step.

The modern rheostat furnace uses sufficient platinum wire to secure a high degree of heat when needed, while the rheostat cuts this heat down at the will of the operator to the requirements of the work in hand, enabling him to secure satisfactory results in spite of fluctuations of the current.

If a furnace is allowed to become thoroughly heated while the control lever remains on the first step, the injuction to move the lever from step to step slowly has little weight; after a thorough preliminary heating of the furnace the lever can be moved at once to the step giving the heat necessary to do the work, assuming this temperature to be known.

On the other hand, throwing a current on a cold furnace while the control lever is on a high step is liable to cause accident, as a greater volume of current passes through a cold wire than passes through the same wire when uniformly heated; this tends to bring the exposed terminals to sudden incandescence, with the possibility of a burn-out.

In reference to throwing the current off suddenly, the only damage to be apprehended from this procedure is quick cooling of the muffle, with the liability of cracks appearing in the muffle clay; this result, however, can be modified, if not entirely prevented, by having the furnace door completely closed when the current is cut off, thereby insuring slow cooling of the interior of the muffle.

I would like to call attention to the modern pyrometer as a means of protecting the dental furnace; while many dentists are able to fuse porcelain with a surprising degree of accuracy without it, the eyesight is injured by the process and the results are not always satisfactory.

A reliable pyrometer always tells the exact heat in the furnace and the procedure with one attached to a Hammond furnace after the usual gradual heating up would be to place the control lever on the particular button that produces the proper heat to fuse the porcelain used and let it remain there until the full heat of that button is developed. Having the work to be fused, say an inlay, on a slab or platinum pan, throw back the lever to the first step, open the door of the muffle and place the inlay in front of it to dry out; pay no attention to the piece, but observe when the pyrometer is run down about 400° F. or more; as soon as this occurs, put the work in the muffle (the placing of the work will cause an almost instantaneous drop of 100° or more in the temperature, but this is quickly recovered), close the knife switch and throw the control lever at once back to the fusing button, close the door and allow the piece to remain until the indicator registers the original fusing heat, then at once open the muffle and remove the work. It is also well to throw back the lever at once to the first contact.

The same sort of procedure worked out with any porcelain will give uniform results without the possibility of a failure unless there are serious variations in the voltage of the current.

The exact fusing temperature of the porcelain need not be known in advance, the pyrometer will show not only what contact for the control lever will afford the necessary heat, but will tell what the fusing temperature is. Therefore, with a pyrometer and the procedure I have mentioned, together with a steady current, any number of pieces of work can be put through one after another and all be fused alike.

Mr. Garhart (closing the discussion on his part):

The great majority of burn-outs are due to the parting of the wire while the furnace is cooling. The condition may be improved by covering the front of the muffle in order that it would cool down slowly. I have tried a number of experiments to overcome this trouble. Several years ago, I tried winding the wire with a covering of silk or cotton and this process has materially lengthened the life of the muffle, but does not overcome the trouble entirely. There is a prominent stretching of the wire which will assert itself later by buckling. In the usual type of muffles where the wiring is covered with thin coating of fire clay, buckling will eventually take place.

In order that an even degree of heat may be secured throughout the entire length of the muffle, it is essential to wind the wire more closely toward the front, farther apart in the center and not quite so close together in the rear. I do not believe that the back portion of the muffle should be covered with wire. I do not cover the back portion of my muffles with wire. Dr. Byram has stated to me that the color of the bridge would be uniform excepting the posterior crown, which would be a shade or so lighter in color, owing to the heat being greater at that point when using a muffle, the back of which has been wound with wire.

I formerly made muffles from plastic clay, but recently have had much better success by using the clay as dry as possible and condensing it by pressure. This method eliminates the shrinkage and which has been supposed to be the cause of the wire buckling by confining the wire in a smaller space. Buckling will occur whether the muffle shrinks or not and it can not be prevented unless sufficient space can be provided that will be ample enough to take care of it. A porcelain muffle will prevent the wire from buckling or extending through the inner portion of the muffle, although the wire must give in some way, so it is doubtful if the life of the wiring could be increased by this method.

In regard to the pyrometer, especially referring to the automatic cut-off device, will say that it is useless unless time is taken into consideration. It has been clearly demonstrated that the fusing of porcelain is a chemical reaction. If you will spend more time on one baking than you would do on another, it is quite natural that different results will be obtained. The time and temperature factors must always be the same in order to obtain like results. The process of baking porcelain should be reduced to an automatic basis. The work should be placed in the muffle with the lever of furnace resting on the first heat contact and then the lever should be moved promptly to the desired heat contact where you know the maximum temperature may be had for that particular brand of porcelain. You may watch the recording hand until it reaches that point or the automatic cut-off device will shut off the current, providing that you have not neglected to set the secondary hand to the right temperature.

Dr. F. E. Roach (closing the discussion):

There has been practically nothing said that proves there is need for a rheostat. I am satisfied that the elimination of the rheostat is an advantage for the reason that when you turn the current on in the beginning the wire is in better condition to accommodate the full current. The muffle, the packing, the furnace, are all in contact with the wire, and the fact that these parts must all be heated up, they carry by convection the heat from the wire and act as a rheostat themselves and it is simply a question of so arranging the wire in the muffle that you will have sufficient wire to accommodate the current on which you are operating.

There is an additional advantage in the use of the long wire in contradistinction to the short wire used in connection with the rheostat. The fact that you have 14 feet of wire of 28 gauge serving as a radiating surface instead of 8 or 10 feet, means that the wire is subjected to a lower degree of heat when producing the heat required to bake the porcelain in the muffle. Therefore, there is less liability of overstrain on the wire by reason of the elimination of the rheostat.

A feature I place great value on is the automatic cut-off. It is not the expectation of the manufacturer or the inventor to produce the necessary brains with a furnace to operate it correctly. If that were possible, I am sure there would be some one anxious to furnish it. But the automatic feature does relieve the operator of a great care and responsibility, and for that reason I believe that the automatic feature is essential and we are bound to come to it in some form or another.

It also is a great conserver of the strain that is liable to occur on the wire if a man will handle his furnace as it should be handled. He will obviate the possibility of overheating the wire. The elimination of the personal equation is an important factor in the uniformity of the results we are likely to have.

There was one question asked as to the cooling of the muffle, the cooling down of the furnace by means of the rheostat. You must cut off the current some time and as long as you have it on the first button, you have it up to considerable heat, so that there is no room for argument on that point. I believe that the wires are usually broken in the furnace cooling off, due to the uneven contraction of the clay and the wire. But we may have a burn-out and discontinuance of the circuit during the time of baking. That may occur by reason of the fact that the wire was previously broken and some little jar has broken the contact between the two ends of the broken wire. I have had a muffle that would bake for a time and then it refuses to heat up. I could not find a sign of a burn-out spot. On picking up the muffle and jostling it a little it would heat up all right. The tester then showed a break in the wire, which showed that the ends would come in contact and complete the circuit, and yet at other times they would not be in contact.

THE DENTAL REVIEW.

Devoted to the Advancement of Dental Science.

PUBLISHED MONTHLY.

EDITOR: C. N. JOHNSON, M. A., L. D. S., D. D. S.

Subscription price $1.00 a year including postage, to all parts of the United States and its possessions, Cuba, Canada and Mexico. All other countries $1.75 a year.

EDITORIAL.

THE VALUE OF DENTAL HISTORY.

The interest in recent years on the part of the profession in matters relating to history is very encouraging. The movement to place the Guerini history in a permanent form before the world is most commendable, and we trust that the report of the committee before the National Dental Association will show material progress. The profession in the past has been very remiss about such matters, the chief interest being centered in present advancement rather than in past achievement. But the deeds of our dental ancestors are not only important as an index of the early development of the profession—they are frequently very instructive in recording the evolution, rise and fall of many theories which have absorbed the attention of the men of those days in the same lively manner that we find manifest today when anything new is advanced.

We can read many an instructive lesson from the experiences of the pioneers. We find, for instance, that all there is of progress is by no means confined to the present era, and some of the revelations of history make us respect more the mental calibre and far-sightedness of the men who were most active in the early development of the profession. It is always interesting or should be interesting, to study the stages by which a profession has grown, and in no less a degree to learn something of the personality of the men instrumental in its growth.

The paper by Dr. Crouse read before the Illinois State Dental Society and published in the August issue of THE DENTAL REVIEW, together with the discussion, proved of absorbing interest to the members. It is a revelation to the younger men to learn something of the conditions existing in the profession even less than half a century ago, and it should always prove a source of inspiration to see what has been accomplished in certain lines, and a source of caution to see where the mistakes have been made. Experience is the most fruitful teacher, and we may profit by the experiences of others as well as our own.

Let the young men study dental history, to the end that they may have an intelligent conception of the foundations upon which their profession has been laid. It will increase their respect for the traditions of dentistry and add to the sense of their obligations and responsibilities in carrying on the work so well begun by their predecessors.

THE EDITOR'S DESK.

ANOTHER VACATION.

In the stress of modern times a vacation seems to have become a necessary and permanent institution. Time was when men took affairs more leisurely and I sometimes think more rationally, when the things that could not conveniently be done today were put off till tomorrow without the least compunction. In those days we did not hear so much of vacations. There was not the need of them. Men were not placed under the stress of high-pressure effort through the greater part of the year, thereby demanding an occasional let-up to bring relief to tired nerves. And yet, after all, who could want to go back to the so-called "good old days"? We live more in a twelvemonth now than our forefathers did in as many years. We see more, feel more, and experience more. If we have the good sense not to allow the extra demands on our time to worry us we assuredly get more out of life. There is nothing so fatal to the development of true manhood as a listless, purposeless, hum-drum existence, and the men who have accomplished things worth while are the men who have worked the hardest.

Even the necessity for taking a vacation is not always an unfortunate thing. A vacation, if spent properly, may be made a means of growth and extended knowledge. I have always felt that the best vacation for professional people was to get away from the abodes of men, and commune as closely as possible with mother nature. It is so restful to throw off the restraint of office exactions, to be away from artificial noises and to escape starched linen. It is usually my good fortune to enjoy such a vacation, and last year I ventured to take the readers of "The Editor's Desk" with me. The interest manifested in the vacation series has prompted me to give another account of a trip this summer—not so long, but very enjoyable. It will embrace a lake trip from Chicago to Mackinac Island, up the St. Mary's river to Sault Ste. Marie, down along the north and east shores of Georgian bay, among the islands of this marvelous region, and across country to my summer home in Ontario. The series will begin in October.

BOOK REVIEWS.

THE TEETH AND THEIR CARE. By Thaddeus P. Hyatt, D. D. S., Brooklyn, N. Y. Pages 43, cloth. Price, 50 cents.

This is a very attractive little volume intended for popular distribution. The teaching is good, the text clear, and the illustrations most excellent. The more of this kind of literature we have distributed the better it will be for the coming generations. Dr. Hyatt has produced a book which is full of good advice without being padded with irrelevant matter. It is a book quickly read and well worth the reading.

DOMESTIC CORRESPONDENCE.

NEW YORK LETTER.

New York, August 15, 1906.

My Dear Mr. Editor:

Again the New Jersey State Dental Society has convened and adjourned at Asbury Park. It was the thirty-sixth annual meeting, July 18th, 19th and 20th.

The meeting was unusually well attended, as shown by the registration books, about nine hundred dentists having recorded. They came from many States and quite a few from foreign countries.

Dr. Eugene S. Talbot, of Chicago, was the chief attraction. Two of the sessions were given over to him. Dr. A. P. Burkhart, of Buffalo, N. Y.; Dr. James E. Power, of Providence, R. I.; Dr. W. B. Dills, of Brooklyn, N. Y., and Dr. A. Irwin, of Camden, N. J., were other essayists.

Clinics were unusually interesting, and many of them. Fifty-three were on the program. About forty-five discharged their obligation to the society. Among those which created the most interest was Dr. Bosworth, of Cleveland, Ohio, who exhibited a new pyrometer for regulating the fusing of porcelain. Dr. E. P. Brown, of New York, baking of porcelain. Dr. A. P. Burkhart, of Buffalo, removable bridge. Dr. C. M. Carr, of Kansas City, showed 150 new instruments on an entirely new principle for the treatment of pyorrhœa. Dr. R. H. Clark, of Northampton, Mass., braces used in pyorrheal cases. Dr. H. P. Cooke, of Worcester, Mass., on wedges and ligatures as applied to separation of teeth and retention of dam. Dr. W. W. Crete, Camden, N. J., showed a removable wire bridge. Dr. G. L. Curtis, of New York, did some alveolar abscess surgery. Dr. L. E. Custer, of Dayton, Ohio, showed several electrical appliances; an electric oven, a lamp glower for illuminating same, warm air blast, miniature electric device for annealing gold, warming gutta percha, water, etc.

Dr. F. A. Greene, of Geneva, N. Y., showed an accurate method of fitting gold crowns and bands. Dr. P. B. McCullough, of Philadelphia, showed his system for artificial substitution of a single missing tooth. Dr. R. S. Miller, of New Haven, Conn., gave some points of very practical value to the porcelain worker. Dr. A. P. Rogers, of Fall River, Mass., showed how inter-maxillary elastics were used in regulating teeth. Dr. M. I. Schamberg, of Philadelphia, had an interesting exhibition of radiographs. Dr. W. B. Short, of New York, baked porcelain inlays over a table Bunsen burner. Dr. F. L. Stanton, of New York, showed how to duplicate plaster models. Dr. William H. Trueman, of Philadelphia, gave a method of attaching without soldering porcelain to crowns and bridges, and Dr. E. C. Beggs, of Mt. Vernon, Ohio, showed some uses of compressed air in dentistry.

The real business of the society began on Wednesday morning at ten o'clock, when the president, Dr. J. E. Duffield, of Camden, N. J., supported by the other officers of the society, took their places on the platform.

After some preliminary business, the president delivered his annual address, which was handed over to a committee, to act upon its recommendations.

The evening session was devoted to an illustrated lantern lecture, by Eugene S. Talbot, M. S., D. D. S., M. D., LL. D., of Chicago, Ill., on the "Etiology and Pathology of Interstitial Gingivitis." The lecture, delivered by such an eminent authority, attracted a large audience, and all listened with profound interest. Dr. Talbot's talk teemed with excellent ideas and theories, and his words of wisdom were greedily absorbed by the dentists who heard him.

The lecture was short, beginning at 8:15 and continuing for about half an hour. He said that "thirty-five years ago, while a dental student, it appealed to me that pathology was taught in a crude manner. There was no connection between the different diseases of the face, mouth, jaws and teeth or between these structures and other parts of the human body. There were many pathologic conditions of the mouth and teeth that could not be accounted for. Pathology must be studied and taught upon broader lines. It seemed to me pathology would be a good subject for my life."

Again, on Thursday morning, Dr. Talbot was the essayist. He followed his subject of the evening before with a paper on the "Therapeusis and Treatment of Interstitial Gingivitis, Due to Autointoxication."

The paper was a learned one and showed extensive and extended research. In an intensely interesting manner, the doctor related the results of 114 cases where the patients were affected with autointoxication. The various symptoms were minutely explained, together with the treatments used.

"Many times have I told my patients they were suffering with autointoxication," said the doctor, "which required treatment. They would later return with the statement from the family physician that they were in perfect health. Had the family physician recognized the tendency to grave disease portrayed in the mouth his diagnosis would have been far different. The patient with interstitial gingivitis due to autointoxication is sick so far as the stomatologist is concerned, although able to come to the office and attend to his duties. He is not sick in the eyes of the family physician since the symptoms have not markedly manifested themselves constitutionally. When the organs are involved, although interstitial gingivitis be present, it is beyond the province of the stomatologist to treat such conditions. The attending physician should be informed. I have saved patients from an early grave by anticipating a tendency to grave disease, avoidable by strict attention to diet and treatment. In other patients, where grave symptoms were observable, I was able to inform the family physician in time to prevent serious result. In a few, it was impossible to prevent rapid progress of disease already well advanced when they came under notice.

OVEREATING WORSE THAN OVERDRINKING.

"There are people in their graves who might be alive and well had they changed their methods of living when requested to do so. Club life and fast living have carried many a man and woman to an early grave. More people are injured by overeating than overdrinking."

After reciting various other treatments for the cure of persons affected with autointoxication, Dr. Talbot closed his paper by condemning certain manufacturers who, for financial reasons, force upon the dental profession effervescing and other preparations to neutralize uric and other acids, entirely ignoring the cause, uric acid not being a cause, but only an expression.

The dental supply people made, if anything, a greater showing this year than ever before. They crowded (not uncomfortably) the very large hall of the auditorium, and those who gave samples were quite liberal. In speaking with several firms doing regular business, they expressed themselves as more than satisfied with the growing tendency on the part of the visiting dentist to do business "on the spot" and his interest in new and progressive paraphernalia.

The general public had heretofore been admitted one afternoon during the meeting, but the exhibit committee and trades people decided not to do it this year. There was much clamoring for admission on the part of sample hunters, which kept two police officers very busy. Cards of admission were issued by the society to each dentist and if a member of his family or friend accompanied him another card of admission was also necessary.

As with all other meetings of the kind, the last day shows considerable shrinkage of attendance. Some few remain for a period of relaxation, but the majority have not closed their offices or have made other plans for the summer outing.

The Friday morning session was continued until the early part of the afternoon.

The association transacted all unfinished business and elected officers and the convention closed.

The officers elected are as follows: President, Dr. H. R. Brinkman; vice-president, Dr. Walter Woolsey, Elizabeth; secretary, Dr. Charles A. Meeker, Newark; assistant secretary, Dr. H. S. Sutphen, Newark; treasurer, Dr. Henry A. Hull, New Brunswick; executive committee, Dr. W. A. Jaquette, Salem; Dr. Charles H. Dilts, Trenton; Dr. Harvey Iredell, New Brunswick; Dr. Frank G. Gregory, Newark; membership committee, Dr. Byron L. Rhome, Asbury Park; Dr. W. F. Naylor, Somerville; Dr. F. K. Heazleton, Trenton; Dr. William I. Thompson, Asbury Park; Dr. William H. Gelston and Dr. C. P. Tuttle, Camden; chairman of essay committee, Dr. Charles H. Dilts, Trenton; chairman of clinic committee, Dr. W. A. Jaquette, Salem. Dr. W. E. Truex, of Freehold, was recommended to the governor for membership on the State Board of Examiners.

The association finds itself deeply indebted to Dr. M. I. Schambrg, D. D. S., M. D., of Philadelphia, for the valuable assistance and brilliant work in connection with discussions on papers read during the convention. Dr. Schamberg supplemented Dr. Power's paper

Thursday evening with an exhibition of lantern slides, showing surgical cases and the value of the x-rays as a diagnostic and therapeutic agent in oral surgery. Sincerely, "THE BOROUGHS."

PRACTICAL HINTS DEPARTMENT.

EDITED BY G. W. JOHNSON, D. D. S.

[This department is for busy readers. We want short articles containing practical ideas—the shorter the better. No article must exceed 200 words, unless of exceptional merit. Every dentist has some useful hint that has been of value to him, and if he will only put it in print it may be of equal value to others. That is what this department is for. Due credit will be given for every article sent. Address G. W. Johnson, THE DENTAL REVIEW, 55 State street, Chicago, Ill.]

Extracting Teeth:—Frequently teeth can be extracted absolutely without pain by the injection of a normal salt solution. We get the psychical effect and in addition quite a little anaesthetic effect.—*Arthur D. Black, Chicago.*

Keep All Cavities Dry for Filling:—We are told not to depend on fillings put in under moisture, and I am inclined to believe that if teeth are so badly broken down that it is impossible to adjust the rubber dam, it is better to resort to inlay work where there are large restorations and depend on the retention of the inlays by cavity preparation and cement to hold it.—*D. M. Gallie, Chicago.*

Material for Filling Children's Teeth:—For children's teeth, or other wholly or partially submarine work, the following formula is recommended:

No. 10 gold, No. 10 tin.—Gold and tin in equal parts; folded and cut in strips.

No amalgams will work easier and no filling of any material whatsoever will approach it as a toothsaver under like conditions.—*J. R. Callahan, Cincinnati, Ohio.*

Be Careful With Your Investigations:—We are often astonished to find that the unexpected happens when least we expect it, and many times we learn things on investigation that were never dreamt of before; even simple things that are, however, fundamental. It took me fifteen years of close application in cleft palate operations before I learned that the upper jaw is as much wider than the lower as the space between the edges of the fissure. And yet it was before me all the time.—*T. W. Brophy, Chicago.*

Attend the Society Meetings:—The dentist living in a rural district has realized how profitable the monthly meeting of the dental society has been to the city practitioner who could, with no inconvenience, become a regular attendant. In fact, it has been a source of wonderment that any energetic practitioner living in easy traveling distance after the day's work is complete, could forego the pleasure and profit of attending such metings as are held six or eight months of the year by the Chicago dental societies.—*E. K. Blair, Waverly, Ill.*

Oil of Cajeput:—Dr. Arthur Matteson, many years ago, told us about the use of this agent in connection with gutta-percha. In placing a temporary stopping in a shallow or saucer-shaped cavity, if the latter be moistened with oil of cajeput warm gutta-percha will adhere to it with special tenacity. It is also an excellent root canal dressing previous to filling with the gutta-percha cone—better for either of these purposes, I think, than the oil of Eucalyptus, and possessed of equal antiseptic properties.—*Garrett Newkirk, Passadena, Cal.*

Amalgam Fillings:—The best method of making amalgam fillings tight is to use all the force we can and pack it along the walls with a very small instrument. The amalgam must be hard enough. It is not so difficult to make walls that are practically perfect. It is easy to make walls that will not show spaces with the naked eye, but it is not so easy to make walls that will not show spaces with the microscope. Still we can make fillings that will do our patients much good, often where a gold filling would not answer as well.—*G. V. Black, Chicago.*

Sloughing Following Cocaine Injections:—The sloughing that sometimes follows cocaine injections is due, of course, to infection, and I think no precaution that any one might take would absolutely prevent that, for two reasons: First, you have anæsthetized tissues in the way, and you place them in a condition in which infection can take place several months, even, after your operation has been performed, and if you have profoundly anæsthetized that tissue you have rendered it extremely liable to infection, so that with all the precautions that you might take infection is possible to follow.—*G. W. Cook, Chicago.*

Advice to the Young Practitioner:—If a new theory or new method is suggested, it is your duty to see what there is in it. You don't want to wait for others to investigate for you. He who stands back and waits for others to find out first whether this method or this practice is a good thing, isn't worth a "hill of beans," either to himself or his profession. He is losing a lot of valuable time and thereby checks his growth, stunts himself, stays in a rut, becomes a back number, and finally dies of dry rot. If there is anything advanced that may enable you to do better work and serve your patients better, you want to "get onto it" at the very earliest moment. You can not afford to wait and let others get there first.—*C. B. Rohland, Alton, Ill.*

Mixing Amalgam:—It is my conviction that the mixing of amalgam in the hand is unscientific and unclean. I can not see how anyone can expect to get good results from such a procedure, incorporating sebacious matter and bits of cuticle into a filling for a tooth. Take your knife blade, scrape the palm of the hand with it and you can see what goes into your filling. Try mixing your amalgam with a stiff steel spatula on glazed paper. Begin with the mortar mix, then transfer to the paper and with the spatula triturate it thoroughly by placing the spatula on the mass and draw it toward you. Mix in this manner three or four times, using a clean place on the paper each time, and it will also clean the amalgam.—*H. N. Jackson, Milwaukee, Wis.*

Local Anæsthetics:—Take precaution in asepsis and that is so easily done that there is no excuse for the dentist not to do so, for he may keep his needles in a solution of carbolic acid for four or five hours, and then in alcohol to neutralize the carbolic acid until they are to be used again. Then the mouth should be washed out well just before the injection is made and only a small amount of local anæsthetic used, relying mostly on the pressure anæsthesia, and there is no danger in the proper solution of cocaine. We know now definitely the dose of cocaine, barring idiosyncrasies, and these usually manifest their peculiarities in the early stage, so if you work slowly you will find them out, and a great deal may be done to prevent trouble.—*Otto Holinger, Chicago.*

Be Careful With Your Anæsthetics:—The universal dread of pain and the necessity for the infliction or more or less pain by the dentist in his operations, has caused untold suffering to the human race and the loss of thousands of teeth. We and our patients sometimes think that if the element of pain could be eliminated from our operations, life would be a continual round of pleasure. Since this is true, it is small wonder that the use of anæsthetics is being pushed to the limit. Dentists are human and if they can substitute smiles for groans and compliments for execrations, the temptation is great to overstep the bounds of caution. Recognizing the above as universal traits of human nature, it requires courage to refuse an anæsthetic. Remember, however, it is a chance and responsibility which no one can divide with you. Can you afford it?—*L. A. Hanaford, Rockford, Ill.*

Cocaine:—While cocaine has been a great blessing to mankind, it has also been a great curse, and is becoming more so every day. The facility with which the tooth pulp may be anæsthetized and removed, and crown and bridge work substituted for well made fillings and partial plates, affords the dentist an opportunity to display his wonderful skill to the people, and at the same time reap a rich financial harvest, so that a great majority of the profession have become crown and bridge work maniacs. I have seen so much injury to the gums, alveolar process and bone, resulting from hypodermic injections, that I would prohibit the use of cocaine in my office if I thought the trouble arose from the use of cocaine *per se*. But I am of the opinion that the trouble frequently comes from the septic matter carried into the tissues beyond by the needle rather than by the irritating properties of the drug itself.—*C. P. Pruyn, Chicago.*

Uniform Fee Bill:—With our methods for the same operations in many cases so different, with a patient frequently incapable of understanding the nature of the operation going from one office to another and honestly or designedly misrepresenting the different offers made; with a suspicious public always alert for anything that looks like a combine; with unprincipled practitioners ever anxious to quote or misquote that they may gain; with those coming to us whom we judge poor and deserving; those whom we call personal friends; and those to whom we extend professional courtesy; with frail human beings for dentists, born with passions the same as other men, to love, to fear, to hate, would it not be surprising if we did not lower the dignity of our profession and by unwarranted suspicion create "an opposition that did not exist"? With these conditions ever existing among us, is there any one thing more prone to sow universal discord in a dental society than a compulsory uniform fee bill?—*T. P. Donelan, Springfield, Ill.*

MEMORANDA.

NORTHERN IOWA DENTAL SOCIETY.

The Northern Iowa Dental Society will meet in Cedar Rapids, September 11, 12, 13, 1906. C. N. BOOTH, *Secretary.*

IDAHO BOARD OF DENTAL EXAMINERS.

The Idaho Boad of Dental Examiners will meet in Boise, December 27, 28, 29, 1906. C. E. M. LOUX, Sec'y.

DELTA SIGMA DELTA FRATERNITY.

The next annual meeting of the Supreme Chapter of the Delta Sigma Delta Fraternity will be held at the Piedmont Hotel, Atlanta, Ga., on Thursday, September 20, 1906. CHARLES R. TURNER, *Supreme Scribe.*

MINNESOTA STATE BOARD OF DENTAL EXAMINERS.

The Minnesota State Board of Dental Examiners will hold their regular meeting on October 2, 3 and 4, at the Dental Department of State University in Minneapolis. All applications must be in by noon of October 2. Any further information will be furnished by DR. GEO. S. TODD, *Sec'y.,*
Lake City, Minn.

NORTHERN INDIANA DENTAL SOCIETY.

The eighteenth annual meeting of the Northern Indiana Dental Society will be held in Hammond, Ind., on September 18 and 19, 1906.

Arrangements are being made to make this the greatest convention ever held in northern Indiana. Already some of the best talent in the country has been secured.

Hammond building, Hammond, Ind.

Samuel A. Bell, *Secretary.*

ST. LOUIS DENTAL SOCIETY CELEBRATES WITH A GOLDEN JUBILEE.

The St. Louis Dental Society, the oldest continuous dental organization in the world, will celebrate its golden anniversary with a banquet and entertainment some time in November, when the fiftieth year of its existence will be completed. Eminent men in the profession outside of the city and State will participate.

More detailed announcement will be given in October issue.

Yours respectfully, **J. B. Newby**,
Chairman Committee on Arrangements.

W. F. Lawrenz, *Secretary.*

REDUCED RAILROAD RATES TO ATLANTA.

A round trip rate of one fare plus twenty-five cents has been secured in all territory south of the Potomac and Ohio and east of the Mississippi.

In all other territory the rate of one and one-third fare on the certificate plan has been granted. Delegates will pay the full fare to Atlanta taking a receipt therefor which will entitle a return at one-third rate. Tickets will be on sale accommodating those who attend the Faculties' and Examiners' Associations as well as the National Dental Association, and the return trip date from Atlanta is September 25.

The Ocean Steamship Company will on September 11 sell tickets at one rate plus $5.00 for the round trip from New York and one fare plus $6.00 from Boston.

J. D. Patterson,
Chairman Executive Committee, National Dental Association.

RECENT PATENTS OF INTEREST TO DENTISTS.

824,087. Tooth brush. Solon E. Babcock, Plateau City, Colo.

824,465. Metallic support for artificial teeth. David N. Booth, New York, N. Y.

824,096. Dental articulator. Walter W. Crate, Camden, N. J.

824,111. Making teeth. Harry A. Gollobin, Newark, N. J.

824,218. Making dental devices. Stanley Towle, Fall River, Mass.

825,268. Antiseptic and perfumed block for dental stoppings and other similar purposes. Lucien Eilertsen, Paris, France.

825,271. Right-angle bur-mandrel. George N. Guthrie Jr., Cookeville, Tenn.

825,578. Tooth shade guide. Arthur W. Browne, Prince Bay, N. Y.

825,356. Artificial tooth for crowns and bridges. William B. Short, New York.

825,891. Dental engine. Arthur W. Browne, Prince Bay, N. Y.

825,896. Dental measuring tool. Francis X. Dusseau and B. F. Kirk, Detroit, Mich.

825,901. Vulcanizer. Edmund D. Gilbert, Philadelphia, Pa.

825,940. Crown tooth attachment. Henry H. Schuhman, Hartford, Wis.

Copies of above patents may be obtained for ten cents each by addressing John A. Saul, solicitor of patents, Fendall building, Washington, D. C.

COLLEGE COMMENCEMENTS.

LOUISVILLE COLLEGE OF DENTISTRY.

Graduates—Banner, W. A., Barnett, W. L., Baucom, B. R., Beeler, D. B., Beeler, T. T., Cornic, N., Crittenden, B. V., Crum, S., Daniel, R. C., DeWitt, A. L., Dismukes, J. M., Doss, L. M., Dyche, R. W., Eden, J. E., Ellington, C. S., France, F., Frear, E. A., Hargis, H. H., Hart, J. D., Hoeffel, P. S., Holloway, G. F., Hudson, A., Lee, D. A., Leonard, J. G., Lyon, W. T., McShane, H. J., Pate, Alva U., Peters, M. E., Phillips, W. F., M. D., Render, L. O., Roberts, J. T., Sherwood, A. A., Tate, V. H., Ward, N. D., Wilhoit, A. D., Woodward, G. B.

PHILADELPHIA DENTAL COLLEGE.

Graduates.—Alexander, W. A., Alvord, W. E., Anderson, E. A., Bartlett, L. V., Borneman, S. S., Boyle, A. A., Bradford, O., Brodie, A. N., Cambage, A. S., Cole, E. C., Cosier, P. G., Davis, H. L., Derr, W. G., Dorland, J. W., Dow, W. D., Finkelstein, S., Jr., Firth, A. J., Fonarton, T. D., Ford, N. R., Greenblatt, O., Haas, A. M., Hargrave, J. J., Haskell, C. R., Jacobson, E. N., Johnson, P. F., Lancit, L. A., Lutton, W. B., Miller, E. C., Myers, W. E., McFadden, G. P., McKibben, A. H., McLaughlin, P. J., Paul, A. R., Rowen, S. M., Sammons, E. J., Schropp, R. J., Sheehan, J. T., Slavin, S., Snyder, C. C., Svenson, C. L., Tetlow, J., Jr., Thomas, A. J., Tobin, J. M., Tower, A. W., Van Riper, W. B., Wenzel, P. M., Wild, Harry, Wilson, W. C.

NORTHWESTERN UNIVERSITY DENTAL SCHOOL.

Graduates, 1905-6.—Alm, G. T., Anderson, R. G., Ashley, E. H., Barke, O. S., Barnett, C. L., Barnett, T. D., Baumgardner, W. J., Best, H. F., Bible, W. L., Bovik, R., Cardy, C. A., Case, C. M., Christianson, J. F., Christopher, J. W., Close, I. E. Conklin. Wilber, R., Crary. E. J.. Crook. W. F., Davis, W. H., Donahue, E. J., Du Chane, W. N., Eisenstaedt, J., Erickson, A., Erwin, C. W., Ford, Z. D., Fox, T. W., Frey, J. P., Furby, J. H., Galbraith, H. L., Gatewood, R. H., Geary, H. L., Giffin, B. B., Gilbert, W. F., Gruenblatt, R., M. D., Hanson, O. W., Haynie, G., Holmes, H. L. Humber, F. R., Joannidi, G. D., Kiel, F. W., Lamley, W. D., Lawson, F. S., Lieberthal, C. P., Light, W., Lowe, J. O., Lyons, H. E., McCracken, T. J., McKibbin, W. H., McNerthney, T. R., Mann, A., Mercer, R. J., Miller, V. A., Mohan, J. F., Moore, O. S., Murray, J. E., Nelson, A. G., Ogilvie, R. A., Olson, W. A., Park, E. S., Partridge, B. S., Peach, L., Peisley, W. S., Pelton, L. A., Plew, C., Puffer, G. R., Rathbone, D. Q., Redeman, E. H., Reynolds, G. F., Richards, C. M., Richards, W. H., Russell, F. L., Sawyer, J. C., Schmuck, E. A., Schroeder, G. M., Scobee, E. L., Seabert, C. P., Searl, C. L., Sengpiel, W. J., Sheffield, J. E., Shuford, T. E., B. S., Spicer, S. S., A. B., Stephens, E. G., Strauss, A. V., Teitgen, W. E., Thompson, J. L., Timmis, J. F., Tolhurst, E. W., Topliff, R. F., Trager, F. A., Tyler, E. C., Unger, I. I., Vinje, E., Weeks, F. T., Weyer, C. N., White, D. N., Whitney, G. B., Wilbur, A. F., Williams, G. W., Wood, E. V., Wood, N. C., B. S., Wright, W. W., Yule, M. A.

Post-Graduate Class, 1906—Belford, E. E., D. D. S.; Bell, A. J., D. D. S.; D'Archambault, L., D. D. S.; Heidel, F. E., D. D. S.; Holloway, W. T., D. D. S., L. D. S.; Lundy, E. A.; Patton, E. M.; Trood, P. H., L. D. S.; Vaeth, O. (Zahnarzt); Vallender, F. H.

THE

DENTAL REVIEW.

VOL. XX. CHICAGO, OCTOBER, 1906. No. ~~9~~10

OUR STRONGEST WEAKNESS.*

BY J. P. LUTHRINGER, D. D. S., PEORIA, ILL.

In the last analysis the successful issue of any and all of life's vocations, so far as the individual is concerned, depends on a proper financial foundation.

Rather a broad assertion, yet a little serious reflection must quickly convince any thoughtful man of its truth. A casual glance about us reveals that all the enduring enterprises of men, individual and corporate, owe their stability to this consideration. It may be said that even the church, to bring its efforts to full fruitage, must subscribe allegiance to this basic principle. We cannot get away from this sordid fact, and, since it plays such an important part in the happiness and well-being of all of us, it is fitting that we consider it now and then.

It may be said at the outset that the writer does not wish to convey the impression that dollar making and dollar saving are the prime essentials of our efforts, but he does say they are so vital that no man can hope to realize the full measure of success in his pursuit unless he give them thought and action commensurate with their importance.

It is an economic law that every man is entitled to the fruits of his labor; it is his solemn moral duty to so conserve these that he may, unhampered, devote his best efforts to the higher ideals of his calling. Yet plain as this duty is, and strange as it may seem, there is a large class of men, who, apparently, do not fully realize this incumbent duty. In fact it is axiomatic that professional men are, to use a trite phrase, poor business men. The natural inference is that they are so engrossed and concerned with the purely professional side of their work that they have neither the time nor the inclination to give the commercial aspect its due consideration. This is very edifying and commendable from one point of view, a sad mistake from another.

---

*Read before the Illinois State Dental Society, May, 1906.

There was a time when the returns for professional services were left solely to the munificence of the recipient thereof. Those good old times have passed away, not without some regret, and new environments force recognition. The intense activities of our time in meeting the various and complex requirements of life make it imperative that we discard the cant that unprofessionalism necessarily enters when we show a decent respect for inoffensive and legitimate commercialism. Because a professional man safeguards his affairs by employing good business principles it is no reason that he should stand accused of unseeming conduct or avariciousness; but it does imply a laudable common sense.

The professional man, by virtue of his special learning and general intellectual acquirements, moves in a higher plane of thought and action than men who engage in the ordinary pursuits. This is so well recognized that he is looked up to, and it is naturally expected that he show his superiority by maintaining his dignity both in his profession and out of it. It naturally follows that he must possess a reserve of this world's goods. These blessings, which he should regard, not as the end but as a means to the end, must accrue from his profession. It is perfectly legitimate and professional for him to demand this. The relation of the commercial and the professional aspects of a vocation is analogous to the relation of the foundation and the edifice. An architect may erect a structure, the design of which may be the sublimest that ever passed from the infinite through the mind of man, yet if it lack an adequate foundation it is a failure. If, on the other hand, the foundation be adequate the structure endures. The joy and delight of all who behold it rest in the superstructure; the chief satisfaction of the architect also lies here, and in regarding it as a consummate whole, his appreciation of the foundation is to the extent that it served as a basis to realize his highest ideals.

We as dentists have been hand in glove with the members of the various other professions in emphasizing this stigma on professional life. I sometimes marvel why dentists are not good business managers. When we recall the wide variety of talents, scientific and mechanical, they must possess; when we contemplate the exactitude and laborious faithfulness to detail required in their work, it seems anomalous that this same discipline does not extend to everything in connection with the profession. They constantly come in contact with dental supply men whose business methods are so precise and systematic that one would think they would profit by the good example.

Unfortunately many of us have not had the advantage of purely commercial training before taking up dentistry. Our colleges help us but little in this respect, and thus handicapped we go forth to take up the struggle. This may give us no particular concern for a time. Perhaps for many years, with good health and large capacity for work, we make plenty of money and "life moves along like a song." Of a sudden reverses come only to find us unprepared to meet them, and for the first time we realize there is something radically wrong in our methods. Or it may be after the frosts of many winters have whitened our hair and relentless Time has dulled the keenness of hand, eye and brain that this unwelcome realization comes to us. There is no picture quite so sad as that of an old man sighing for the lost possibilities of brilliant opportunities.

This weakness of the dental profession occasionally rises to the surface at our meetings and we are roundly scolded for being as we are. The major portion of these tirades, while just and well meant, fall wide of the mark in that they are fragmentary, complaint being directed at only a few of the more obvious faults of which we stand indicted. The mere correction of the few instanced shortcomings will not place one's affairs on a business basis. He must go deeper, or, rather, he must commence at the beginning. And right here is where the trouble is found; we do not know how or where to begin. The plain truth is it is sheer ignorance, not indifference, which deters us. At the same time we do not realize the importance of it.

From personal investigation the writer is convinced that a very small per cent of the young graduates know how to proceed. They do know the supply houses will sell them examination blanks and a ledger. Many, perhaps, do not even verify this knowledge, or if they do they forget after a while that they have. Such a thing as a system in this connection has never been dreamed of. True, many have some ideas of what should be done but they are not sufficiently coherent to admit of reduction to a practical working plan.

At the risk of being criticised for simplicity, I have undertaken to set down the essential initial steps which must be taken to place the commercial affairs of the dentist's profession on a business foundation. Ultimate success will depend on perseverance and the personal equation.

There is absolutely nothing new offered, the prime idea is to give a systematic method of procedure that will enable the most inexperienced recruit to take the initial steps properly. Many things mentioned go without saying, yet the writer deems it fit to omit nothing that will defeat the idea of completeness.

Some accessories are required, a descriptive list of which follows:

1. Appointment book.
2. Bound examination blanks. Similar to Allan's.
3. Day book. Size, 6 by 12 inches. About 250 pages.
4. Dental ledger, or card system of accounts.
5. Expense book. Size 6 by 12 inches. Similar to a counter blotter.
6. Cash book. Flexible leather binding. Size, 5 by 8 inches. About 100 pages.
7. Clip board bill file.
8. Business ledger. Size and binding same as cash book. About 150 pages.
9. Want book. Size, 3 by 6 inches.
10. Inventory book. Similar to expense book.

The manner of procedure, emphasized with numerous comments, is as follows:

Beginning with the entrance of the patient into the chair, write name, address, date and reference on examination blank. Do not hesitate to ask directly who among your acquaintances was sufficiently impressed with your skill to speak a kind word for you, or something of that sort. Indicate character of attention each tooth requires, together with such notations as will assist in planning out the sittings, having in view the accomplishment of the greatest amount of work in the fewest number of visits possible. Then make reservation on appointment book.

Check off each item, with date, at completion of operation and enter charge at once on the day book. With these two books before you transfer to the ledger or card, checking it off the day book and not omitting diagram and necessary remarks.

After experience with both the dental ledger and the card system the writer prefers the latter. The card system is a perpetual ledger, readily referred to and easily handled, besides a supply of blanks is always at hand. The writer has found Trigg's cards No. 3 quite satisfactory. These books should be on your desk during working hours, at night they should be secured against destruction. It is next to impossible to collect an account unless you can produce the original entries.

It may not always be convenient to complete the entry at once, but make it a rule to do so before leaving the office for the day. When we remember the number of such entries ranges from one to ten, with probably an average of six for most of us, the time required should not be great. Whatever else you do don't neglect this, for if you do you are certain to overlook charges, which simply means you give your service gratis; moreover it is not business. Then, too, it enables you to render a bill instanter which often results in prompt payment.

Exercise the same, or even greater, care in crediting payments; don't delay for an instant. Enter on the daybook first; whereas charge items are entered beginning at the top line and working down, the credits are made, preferably on every other page, beginning at the bottom line, working up till they meet the charge items. This brings quite a number together, the totals being carried from page to page give the collections for the month. Likewise the totals of the charge items exhibit the amount of business. Thus you have a permanent record of the business and collections for each day, week and month which will prove interesting as time goes on. When the end of the month rolls around run up your totals and your books are up to date. You are not confronted with the prospect of a two or three nights' tussle with them. It is but the work of a few minutes to get the bills on their way to the delinquents. Neither delay nor apology need be considered in rendering a bill for services. If necessary invoke the aid of a collector and the law.

As each one should know the amount of his expenditures the indispensability of an expense account book is so obvious that it is useless to dwell on its necessity. "Office expenses" and "Personal expenses" should be kept on parallel pages for each month, carrying the totals forward to the end of the year. The writer earnestly urges every new recruit to give particular attention to his personal expenditures. While it may be impossible to jot down every penny still the larger amounts can be noted in a vest pocket memorandum book, and later condensed and transferred. At the end of the month when you balance up you may charge the discrepancy as "incidentals."

The cash book is probably the easiest to keep. It simply involves entering the totals for each month under the headings: "Office expenses" and "Personal expenses" on one page, and "Business" and "Collections" across on the opposite. At a glance you have the totals for each and every month and for the year.

A clip board bill file is another necessity which cannot be overlooked. As the number of bills, receipts and important letters which comes to the dentist is relatively small, one file will answer for all. These should be placed thereon in the order of reception. The accumulation of two or three years will probably fill the file; this should be removed en masse and bound by passing a piece of wire or string through the perforations. Then by pasting at the end a plain paper cover, on which the proper dates are inscribed, you have it in a permanent form. You will refer to this collection occasionally, and it will save paying a bill twice, among other things.

Another indispensable thing is the business ledger. The name of each concern you deal with should be entered, the date and amount of each invoice, no matter how small, as well as the amounts paid. Make these entries when the bills and receipts are filed, consulting at the same time the expense book. True, the various firms will keep your accounts, but you serve your own interests to do likewise. Mistakes are thereby corrected. Moreover, you should know the yearly amount of business done with each firm.

And, right here, let me say the writer thinks it a good business policy to give the bulk of your trade to one supply house. Trade with three or four if you wish, but have one from which you buy principally. The reason is this: by dividing your business among six, or eight, or ten, it is not worth much to any of the concerns. You are not a recognized customer of any, being classed as a "pick up," and are thereby deprived of inside tips and little courtesies and favors that are worth while. Business concerns realize that they cannot sell to everyone, and, as a consequence, take the view expressed here.

The humble want book has not received due consideration from us as dentists. Too many regard it as a superfluity, but it is not by any means. Who has escaped the harrowing experience of discovering, after the departure of the supply man, that the thing he wanted above all others had been overlooked? If, instead of making a hasty inventory at the last minute and jotting the items on the back of an envelope, he has the habit of noting in his book each want as soon as discovered, he has probably escaped this mental disturbance. Neglect in this matter is unfair, not only to yourself but also to the supply man and those awaiting their turn; they may be in a hurry. A pigeon-hole in your desk will keep the book within easy reach.

Of course, every dentist carries insurance on his office and equipment. In the event of loss the settlement is based on the inventory. The book suggested will hold the inventories for a number of years. After the initial classified entries are recorded the subsequent revisions can be made with ease and rapidity; this should be done at least every two years, preferably every year. Your tax assessment is also based on this. It is unwise to place the policy and the inventory in your desk.

As yet nothing has been said about the book that is of the utmost importance—the bank book. Every one knows the folly of carrying large sums of money in his pocket. There is little hope for the man who is careless in the actual handling of cash. Little need be said of this book, except be sure to have one. Keep close tab on it, and when your balance is considerably larger than you need, put it out at interest or make an investment. It is a good business policy to give checks only in payment of book accounts and large bills.

This exposition would not be complete without a few hints which seem to fit in nowhere so well as at this point.

Promptness should be the watchword in everything pertaining to this part of the profession. Delay invites forgetfulness.

Remittances received by mail should be acknowledged the same day. Do not permit unanswered letters to accumulate; at the end of the month run over the mail you have laid by, consigning all useless pieces to the waste basket.

Establish your consistency in asking early settlement by paying your own bills promptly. Make it a rule to settle all bills, local and foreign, the first of the month.

Never fail to take advantage of a discount for cash; it is like finding money. Supply houses tender discount in two forms; a certain per cent for immediate payment, and crediting your account with one hundred dollars upon remitting ninety in advance; thereby you secure a 10 per cent reduction on even the smallest purchase, barring precious metals. The last word in this connection is this: it is unfair and unbusinesslike to ask any house to keep your account open longer than twelve months; close it up the first of the year and begin again if that is the best you can do.

Rule up all accounts as soon as they balance. At the end of the year run up the remaining totals and determine where you are "at."

Draw off your accounts at least once a year, to determine the amount outstanding, classifying under the headings: "Collectable," "Doubtful," "Uncollectable." Then make a determined effort to collect.

It is a good idea to make investigation before extending credit, but it is a better idea to study human nature, for there will come a time presently when you can "size up" a person in two minutes..

Buy what you want, or what you think you want, if you can afford it; but don't buy because somebody else has, or because somebody thinks you ought. Be independent enough to do your own thinking.

Gold bricks with prize package attachment and the seductive installment plan of payment should be shunned. To some this may sound silly and, at the same time, amusingly simple; and so it would be if it were not for the sad fact that the victims are so numerous.

Gentlemen, we professional men are preyed upon by book concerns and others who know us as "easy marks." They understand our human nature as well as our inability to look a business proposition squarely in the face from a commercial standpoint. As a consequence they load us up with their books and other things, which we usually do not want, through the medium of the insidious and alluring installment plan, grafted on us with oily words, which so circumscribe us that we either have to purchase the agent's good opinion, by taking the books, or standing a self-confessed ignoramus if we refuse.

Doubtless some are revolving in their minds these questions: "Why all this bookkeeping? Why devote so much time and labor to these numerous details? What does it all amount to?" etc., etc.

In answer I will simply say it is business. Did it ever occur to you that the man that systematizes his work can accomplish infinitely more than can he whose affairs are in chaos? I have noticed that we usually find time to do that which we really want to do.

This is practically the way every good business man arranges his affairs; he safeguards them to the extent of making himself master of the situation; he knows what he can and what he can not undertake; he knows just where he stands in relation to his business, to himself, to his family, and to his fellowmen. And when he shuffles off this mortal coil his administrators are not confronted with a condition of affairs resembling nothing so much as a Chinese puzzle. Those dependent on him receive all that is due them, and so does everybody else. It is well to bear this thought in mind.

Some one may ask: "Do you think if a man follows the plan outlined above it will make him a business man forthwith?"

No, I don't think it will. But I do think he has the proper start, the proper foundation, and if he work conscientiously along these lines; if he study and compare the contents of his books from time to time; if he take a pardonable pride in laying something by, he is bound to form habits of thought and action in this connection which will result in developing him into an infinitely better business man than are 90 per cent of his professional brethren today.

I believe dentists would make as good business men as any other class if they would only set themselves to the task; it is largely a matter of development. It means time, and work, and trouble, but if we do not consider our profession worth the time, work and trouble it requires, in all its varied phases, then we would better look to greener fields.

I am neither optimistic nor egotistic enough to think that a reformation will at once take form; but I do think it is more sensible to sing the Anvil chorus than the Swan song to this, our greatest weakness. If a reformation is to come it must come from the fountain head, the dental college. We are told that relatively a small per cent of recruits have a preceptor other than the college. From a commercial standpoint this is not regrettable. We look to the college to instill and foster the professional spirit; while it is unfair to impose too much on these institutions, still I believe if the coming dentist is to be a good business man the foundation must be laid here.

SOMNOFORME: ITS USE AND A FEW PERSONAL EXPERIENCES WITH IT.*

BY J. W. RITTER, D. D. S., CHARLESTON, ILL.

Of the numerous devices and preparations for the production of anæsthesia that have been placed before the dental profession during the last decade, possibly the most notable and the one which has attracted the greatest attention is somnoforme, the new anæsthetic, which was first produced by Dr. Rolland, of France.

There is no desire on the part of the essayist to bring this or any other substance used as an anæsthetic into disrepute, but rather to stimulate the members of this society to a more thorough investigation of this or any other anæsthetic which may be placed before us for consideration.

Let me ask, how many men who are using somnoforme today have ever made any investigation regarding its physical properties, or the therapeutic action of the substances of which it is made? Are we doing a little individual thinking? Do we possess ideas of our own along these lines? Or are we permitting the manufacturers and jobbers to think for us? I fear that these same manufacturers and jobbers in their zeal for the advancement of their wares have put forth some extravagant claims for somnoforme, and the members of the dental profession, with lamb-like meekness, are accepting the assertions put forth without one particle of investigation; and somnoforme is pushed before the dentists with the dollar sign more in evidence than the truth, a condition which should be deplored by the profession.

Among the pamphlets forwarded to me by the American agents for somnoforme was one entitled, "A short scientific treatise on general anæsthesia produced by somnoforme, the quickest, simplest, and one of the safest of all anæsthetics." The contents of this pamphlet borders on the present day patent medicine advertisements, containing short testimonials from different dental and medical publications and from members of the profession, from which the following two are fair samples.

---

*Read before the Illinois State Dental Society, May, 1906.

As: "Get used to it as quickly as you can; I feel that it is the anæsthetic par excellence for dental operations." (Dr. A. F. Braudy-Mills, L. D. S.) from the *British Dental Journal,* October, 1905.

Another: "Somnoforme has a remarkable record, the number of anæsthesias produced by somnoforme being considerable over the million mark." Thus leaving the impression with the reader that it is absolutely harmless, with no bad after effects, and with never a death from its use mentioned—an idea which I hope to be able to dispel from the minds of a few before I have finished.

In the same pamphlet there is a quotation with no references as to its origin, that is as follows: "The qualities of a mixture are entirely independent from the individual qualities of its components," a statement which I fear many present can not accept as true in every case of drug combination, and if not true in every case, how are we to be absolutely certain it is in this?

Let us turn on a small searchlight of investigation and endeavor to ascertain a few of the physical properties and the therapeutic action of the constituents which go to make up this mixture known as somnoforme.

Ethyl chloride forms 60 per cent of somnoforme and it is produced by the action of hydrochloric acid gas on an alcoholic solution of zinc chloride. It was suggested as a general anæsthetic because of its volatility, ease of administration, rapidity of action, and, I believe, is the agent which goes furthest in producing the rapid action of somnoforme.

The action of ethyl chloride is accompanied by marked vascular and cardiac depression.

Bromide of ethyl, forming 5 per cent of somnoforme, is produced by distilling together absolute alcohol and bromine in presence of amorphous phosphorus. It is difficult to produce in absolute purity, and it is liable to decompose after distillation. (Physical effects, depress circulation by diminishing the force and frequency of the heart action. According to Dr. Ott, it kills by paralysis of respiratory center, to which paralysis, the cardiac depression, is tributary.)

Methyl chloride, it is claimed, composes 35 per cent of somnoforme; is produced by the action of hydrochloric acid on methyl alcohol. To date I have been unable to procure data regarding the use of methyl chloride as a general anæsthetic, consequently I possess no authentic knowledge regarding its action on cardiac, vascular or respiratory systems. In my efforts to learn if this substance had been administered as a general anæsthetic, I applied to Merck & Co., Schering & Glatz and Fries Brothers, and herewith enclose a copy of correspondence with Fries Brothers.

COPY.

April 23, 1906.

Fries Brothers, New York:

Gentlemen—Will you kindly inform me if methyl chloride is ever used as a general anæsthetic? If so, what would be its physiological action on cardiac, vascular and respiratory systems? If death were to follow its use, how would it be produced?

Very truly yours, J. W. Ritter.

April 25, 1906.

J. W. Ritter, Charleston, Ill.:

Dear Sir—Methyl chloride, especially in mixture with ethyl chloride, is occasionally used for local anæsthesia. However, we recommend only pure chloride of ethyl for local as well as general anæsthesia. Under no circumstances would we advise methyl chloride being used for general anæsthesia; in fact, it would be very dangerous if so used.

Regarding any deaths being produced by its use, we are not aware of any one having reported using it, consequently we can not give you the detailed information that you ask for.

Yours truly, Fries Brothers.

If we consider the physical effects of ethyl chloride and ethyl bromide (both of which depress the heart, in force as well as frequency of action, while death from ethyl bromide is produced directly by paralysis of the center of respiration in the brain), are we to suppose, and the manufacturers give us no information on the subject, that methyl chloride is to be the substance which will overcome all the disagreeable effects as produced by the other two?

There is an axiom which enters into the consideration of these subjects, as follows: "Those anæsthetics are safest whose elements in themselves are harmless." Now, let us compare this axiom with the statement above taken from the somnoforme literature as printed by E. de Trey & Son, that "the qualities of a mixture are entirely independent from the individual qualities of its components."

If the axiom is true, then the quotations as given must not be correct, as we know that ethyl chloride and ethyl bromide are not, when administered separately, free from danger signs and in many cases have produced death. Possibly there was never an anæsthetic produced which has had the meteoric career possessed by this one. It was little known in this country at the time of the last "International Dental Congress" held at St. Louis, where I saw it administered for the first time. I was seized with a desire to try it in my own practice, though I finally concluded that I would wait and see what the results would be at the end of six months in the hands of my brothers in the profession. If there were no bad results, I might consider it, and month after month there was nothing but praises for this new drug combination. Nearly every dental supply man told me of its good qualities. It was extolled to the skies and the dental journals began to laud it. When first demonstrated at St. Louis there had been 100,000 recorded administrations and no bad effects. Then 200,000 cases, finally 400,000 recorded cases, and no deaths or unpleasant effects. By this time that little microbe of desire was consuming me, body and soul, and your humble servant joined the ranks of that ever-growing throng of somnoforme enthusiasts, without one particle of knowledge of its ingredients, after having deluded himself into thinking that it was the safest of all preparations for producing anæsthesia, and that there was no danger.

Results at first were lovely. No bad after effects, no cyanosis, absolutely no struggling, though we did finally come in contact with a patient who was nauseated after regaining consciousness, then a patient who became frantic after I had extracted, and we were waiting for her to regain consciousness, two men being required to prevent her from leaving the chair and the office. During the excitement she succeeded in planting her foot against the abdomen of the operator with sufficient force to land him in the corner of the room. All of this we could stand very well, but the last week of December, 1905, a patient, Miss B., 17 years of age, presented herself for the removal of a pulp, the apical portion of which possessed a considerable amount of vitality while the coronal portion did not respond. The patient had suffered for several days with periodical pains which caused her to lose considerable rest at night. She would not permit a very thorough examination so I concluded to administer somnoforme for the removal of the pulp in its entirety.

The patient seemed apparently in good health, was of a very active disposition, pulse good, no heart lesions, and, as I considered, an ideal patient for somnoforme. The anæsthetic was administered in the usual manner. The patient exhibited signs of nervousness which I endeavored to allay while I was adjusting the face piece. The results were perfect, the operation was performed, the pulp was removed and while waiting for the patient to return to consciousness I noted a labored respiration which became marked; all the time the pulse was apparently normal. Artificial respiration was resorted to. Then on searching for the pulse we found that it was diminishing in force as well as frequency. While the assistant was preparing the hypodermic of strychnine 1/30 and nitroglycerin 1/100, artificial respiration was again resorted to. At the time of administering the hypodermic the pulse had ceased though of course the operator did not spend much time in searching for the same, as he had concluded that time was precious. Nitrite of amyl was administered and artificial respiration was continued. At the end of eight or ten minutes the respiration began to be less forced, while the heart action began to improve immediately after the nitrite of amyl was administered. The patient stated after regaining consciousness that she had no knowledge of her surroundings until placed on a couch, about thirty minutes after the beginning of the administration of the anæsthetic, all of which seemed nearer thirty hours to your humble servant. At the end of two hours the patient was able to leave the office. She complained of feeling very drowsy that evening, and was restless during the night, and would cry out in her sleep.

Owing to these experiences I do not feel that I care to take the lives of my patients into my keeping for a few paltry dollars.

Furthermore, after a careful consideration of this question and a study of the physiological properties of the substances which go to make up somnoforme, I believe that the rapid action of the anæsthetic and the good results claimed for it are produced by ethyl chloride, as it composes 60 per cent of somnoforme; and I feel that if I must use a general anæsthetic of this nature that I might better administer ethyl chloride, instead of somnoforme, and if I am so unfortunate as to encounter dangerous symptoms, I will know that I have but one agent to combat or overcome, while with this preparation the anæsthetist is unable to advance an idea as to which of the three ingredients is causing the trouble.

Dr. Harrison, of Chicago, in the *Items of Interest* for April, refers to three deaths from somnoforme, the authenticity of which I am unable to vouch for, though I do wish to incorporate in this paper an article copied from the *British Journal of Dental Science* of May 2, 1904 (please note the date), because it contains the report of the deposition made at the coroner's inquest by the physician who administered the anæsthetic in each case, and to me it is quite conclusive evidence.

COPY.

SOMNOFORME.

Taken from the *British Journal of Dental Science,* Vol. XLVII, No. 871, May 2, 1904.

To the Editor of the British Journal of Dental Science,
39 Fitz James Avenue, W.

April 27, 1904.

Dear Sir: My attention has today been called to two articles in the last two issues of your journal.

I refer to the report of a death under ethyl chloride in your issue of April 1st, and the leading article entitled "Safety of Ethyl Chloride," in the number published on April 15th.

My excuse for writing this is that a very serious mistake occurs in the first mentioned report, and as your leading article of April 15th is to a large extent based on the facts narrated in that report, it naturally follows that your article is also fallacious.

I am able to speak with authority on the case reported in your April 1st issue, as not only have I had an opportunity of reading the depositions made at the coroner's inquest, but I also had a conversation with the doctor who administered the anæsthetic and am in possession of full notes on the case.

The mistake in your report which I refer to lies in the fact that somnoforme was the anæsthetic employed and *not* pure ethyl chloride, as stated in your report.

Both fatalities therefore lately reported occurred after the administration of somnoforme, and your leading article should have been headed "The Safety of Somnoforme," not ethyl chloride.

In your article you state that somnoforme "is known to be a compound of chloride of ethyl, chloride of methyl, and bromide of ethyl," though the greatest proportion of the compound is chloride of ethyl, and this is also probably the really anæsthetic factor.

This is no doubt quite true; but the really important point lies in the fact that bromide of ethyl is a most lethal and dangerous drug, the death rate of which, when used alone, as often happens on the continent, is placed as high as 1 in 4,000 by some observers. My authority for this statement is the *British Medical Journal,* in which a correspondence on this subject was carried on early last autumn.

I am sure that you will admit that I have some grounds for writing to you on this subject, as your articles, if left uncorrected, would tend to bring a really valuable and safe anæsthetic agent (ethyl chloride) into disrepute, when the real cause of both fatalities was in all probability ethyl bromide as contained in somnoforme.

* * * * * * * * * *

With apologies for encroaching on your valuable time and space, I remain,

Yours faithfully,

Arnold Moritz, B. A., M. B., B. C., Contab.
House Anæsthetist Royal Dental Hospital of London.

Again let me ask how many of you gentlemen who might be classed as somnoforme enthusiasts have ever stopped to consider what you would do if you came in contact with a patient who does not return to consciousness after the administration of this agent? I wish to say that in all of the literature published which I have read, there is no mention or suggestion of any agent or agents to be employed in case of an emergency or collapse, thus leaving the impression of absolute safety of somnoforme.

In reply to a letter addressed to the American agents asking for literature and antidotes to be employed in case of alarming symptoms was a postscript only, naming strychnine, nitroglycerin and nitrite of amyl.

Before closing let me say that I hope those present who contemplate the use of somnoforme will study it closely with a view to safeguarding their patients as well as protecting themselves, and to those who are and have been using it successfully, I beg of you that you study it more carefully, ever bearing in mind that when you administer it there is a danger connected with the procedure, and never, never tell a patient that there is absolutely no danger, and thus avoid a stain on your souls should you be so unfortunate as to have a fatality.

A FEW EXPERIMENTS WITH GOLD.

BY L. S. TENNEY, D. D. S., CHICAGO, ILL.

In attempting a few experiments with gold I not only discovered the extreme difficulty of making practical deductions from laboratory tests, but I also discovered that to arrive at any satisfactory conclusions would require a far more extensive line of experiments than I had allowed myself time to undertake. What I present tonight, therefore, must be regarded as crude and elemental.

I might say in passing that the few experiments I have made have fully convinced me that not until we have made fillings out of the mouth and tested them for tensile strength, weight, specific gravity, etc., do we fully realize the behavior of this material under varying conditions.

There has of late been rather extensively advertised a new form of crystal gold called Keeton Gold, and my object primarily in undertaking these experiments was to ascertain so far as laboratory tests would enable me to do so whether or not this gold possessed the merits claimed by its manufacturers. I think it will be generally acknowledged that crystal gold has its place in dentistry and that its field would be greatly widened were it more uniform and reliable in its welding properties. But the difficulty of obtaining perfect density, and its habit of failing of perfect cohesion at critical moments, has led us to regard it as unsatisfactory and unreliable.

In the tests madè four forms of gold were used—foil, Moss fibre, Watts crystal and Keeton. Four fillings were made of each. For

---

* Read before the Odontological Society of Chicago, February, 1906.

this purpose a steel die was used containing a cavity measuring thirty-four cubic millimeters. The first filling of each form of gold was inserted by hand pressure, the second with a light mallet blow, the third with a medium mallet blow and the fourth with a heavy mallet blow. It must be remembered that in making a number of fillings the force employed in condensing is liable to variations, although I endeavored to keep the force as uniform as possible in making the several fillings.

I discovered by use of a testing machine that my hand pressure runs very evenly, and I kept the mallet force as evenly gauged as possible. After inserting and polishing the sixteen fillings they were carefully weighed with the following result:

	Foil. Grains.	Moss F. Grains.	Watts. Grains.	Keeton. Grains.
Hand Pressure	.381	.4205	.3805	.377
Light Mallet	.442	.335	.345	.341
Medium Mallet	.526	.405	.370	.381
Heavy Mallet	.593	.449	.4245	.442

This test merely indicates the amount of gold I succeeded in condensing in the cavity. Where hand pressure was employed the Moss fiber weighed the most, but when the mallet was used the foil outweighed the crystal golds.

One fact that came as rather a surprise was the discovery that in the case of the crystal golds the fillings made by hand pressure outweighed those made with a light mallet blow, although the fillings became heavier in each case when greater mallet force was employed. It is a question as to what extent we may judge of the quality of a filling by its weight.

While it is true that the greater the weight the greater must be the density of the mass, yet we reach a point where for practical purposes no greater density is required and the perfection of the filling then depends upon cohesion, adaptation and form.

A filling may have great density without its being perfectly welded and the resistance offered by a filling, therefore, would appear to be a more important factor than its weight. The resistance offered by each filling was accordingly determined, the results of which will be given presently.

Following the weighing of the fillings they were immersed in water and forty-eight hours later their specific gravity taken.

The specific gravity of gold beaten with a sledge is 19.40. In taking the specific gravity of the test fillings, only those were used which had been inserted by heavy mallet pressure. The results were: Foil, 19.13; Keeton, 17.68; Moss fiber, 17.26, and Watts crystal, 16.64. It will be seen that the specific gravity of the foil approached most nearly to that of hammered gold, while the crystal golds fell somewhat below.

In determining the resistance of the fillings a dynomometer with micrometer attachment was made use of.

The following table indicates the amount each filling was compressed under first 200 pounds and then 300 pounds pressure:

	Pounds.	Foils. Inches.	Moss F. Inches.	Watts. Inches.	Keeton. Inches.
Hand Pressure	200	.019	.017	.019	.018
Hand Pressure	300	.034	.028	.033	.034
Light Mallet	200	.017	.039	.028	.036
Light Mallet	300	.028	.049	.041	.040
Medium Mallet	200	.002	.017	.017	.015
Medium Mallet	300	.006	.031	.032	.024
Heavy Mallet	200	.001	.008	.008	.004
Heavy Mallet	300	.002	.018	.018	.012

In these tests it will be seen that the foil offered the greatest resistance, while in the three forms of crystal gold the Keeton did considerably better than the Moss fiber or Watts.

In the case of hand pressure, however, the crystal golds showed somewhat less compression than the foil, but when the light, medium and heavy mallet blow was used the resultant fillings showed less compression in the foil than in the crystal golds.

The question naturally arises whether in the crystal gold we have all the strength required for practical purposes or whether we actually require all the strength exhibited by the foil. I had hoped to undertake some experiments bearing on this point, but lack of time and material has prevented me from doing so.

In making the above tests I soon became fully convinced that in order to reach any just conclusion a far greater number of similar experiments would have to be made.

Gold seems to vary so greatly under apparently the same conditions that a large number of fillings would have to be tested out before we could judge results with any considerable degree of accuracy.

We might make one hundred or more fillings of the same gold and with apparently the same condensing force and find no two of them of the same weight. Indeed we would undoubtedly find a marked variation.

The same variation would be met with in their specific gravity and also in their power of resistance to pressure. From this it would appear that the only way to arrive at even an approximate estimate of the comparative density and strength of different golds would be to take the average of a great number of fillings.

In conclusion I desire to state that all of these experiments were made in the laboratory of Dr. G. V. Black, and with instruments devised by him for this purpose.

HARMONY IN THE DENTAL PROFESSION.*

BY DR. E. K. BLAIR, WAVERLY, ILL.

The topic assigned to me by your committee is one that should appeal with great force to every member of our profession. Having by rapid strides passed from the position of isolated practitioners, widely separated geographically, into a very close if not crowded relationship, we are daily confronted with the problem of properly deporting ourselves as neighbors and co-workers.

Less than twenty-five years ago the territory tributary to most offices was so great that contact, either agreeable or disappointing, was of little consequence.

Prior to that date and since then a great amount of energy was expended in endeavoring to impress upon the minds of those we met the necessity of caring for the teeth.

Reflecting upon the past we are forcibly reminded that graduates of today owe a debt of gratitude, though they may not fully appreciate it, to those tireless workers who endeavored amidst great difficulties to bring about a relationship betwixt patient and practitioner helpful and agreeable to both.

---

*Read before the Sangamo-Menard Co. Dental Society.

These legacies of honest example, of noble endeavor, and of untiring devotion have made our chosen profession a blessing to suffering humanity and a personal pride to each of us. The pioneers of dentistry shall not be forgotten. All honor and credit to them. Cast in molds that shaped them for the spheres they so grandly filled, their achievements are the full recorded history of dentistry, and we are justly proud of them.

My purpose in referring to the past is to impress upon your minds the rapidity with which our environments have been transformed and to invite you to a closer and more thoughtful observance of the conditions surrounding us at this time.

From the meager number of yesterday we have rapidly grown into the army of today. From the comfortable isolation so carelessly enjoyed we are drawing nearer and nearer together, with a perpetual thickening of the ranks, with a list of recruits not to be lightly ignored when we give thought to our mutual relations.

Happily, with the additions of numerous practitioners the percentage of people who wholly neglect the care of their teeth has grown measurably less. If the people have been prompt to appreciate the value of our services the profession has been more alert in meeting their wants.

The period of seclusion and privacy of the dental office to the neighbor practitioner was of short duration. In the very nature of things it could not be otherwise. We need one another, and just in proportion to the degree of intelligence that we possess and the honesty of our purposes have we been drawn together.

Self improvement, growth, and advancement; intercourse and the interchange of ideas have been and always will be synonymous terms. To a greater extent than ever before students are taught dentistry as a pure science and by the close of their college careers are fully impressed with the thought that their claim to self-respect and the approval of their fellow practitioners rests almost wholly upon their ability and determination to render honorable and competent service to their patients.

For the future of dentistry as a science we need have no fear. How we may deport ourselves as neighbors is another and ever present question. What I shall say as to this shall be applicable to the great mass of practitioners and in no way personal. This disclaimer is most emphatic and it is hoped it will be so taken and accepted.

Inseparably connected with the ethical aspect of professional life are to be found all of the more minute details bearing upon our daily duties. It is practically impossible to occupy a thoroughly independent position.

If we bend every energy toward the accomplishment of our highest ideals, if we cast our full strength morally and intellectually into our daily tasks, the results will be the attainment of lofty purposes and we will not only benefit our patients and reap a rich personal reward, but the influence of such devotion to ennobling themes will spread in ever widening circles far beyond our expectations.

The blessed influence of the pioneers of dentistry who knew no law but that of equal and exact justice, crowned with an unfaltering devotion to the improvement of art technique is shedding its beneficent rays now and will continue to do so for all time to come.

On the other hand, if we imagine that, acting as separate individuals, we may partially or in greater degree infringe upon a proper ethical standard, we will find ourselves descending by a sliding scale into that miserable attitude morally and intellectually which serves not only to drag us down as individuals, but with sure and positive results lowers the standard of the service we render to our patrons. In addition to these deplorable effects felt personally by the non-ethical practitioner there will extend to whomsoever may be so unfortunate as to fall within his harmful influence all of the evils that right minded men are striving daily to avoid.

You ask what have these thoughts to do with harmony in the dental profession. My reply is that the foundation for the only line of concerted action worthy the support of any honorable and upright body of co-workers is and must necessarily be one commanding the respect and confidence of the most scrutinizing observers. Men can not be banded together permanently under any other banner than one inviting the respect of the world.

History does not record the formation of any organized body of scientists with the avowed purpose either directly or indirectly of lowering standards of excellence.

Every law of estoppel, legal, moral and professional, prohibits the growth of such combinations. The conscience of the better world would frown upon its promoters and their efforts would meet with disaster.

Liberty of action is the watchword of the age, concerted action within proper limitations the battle cry of every progressive people.

"'Together' is the great watchword in this affair, as it is in every other important affair in human life," said Edward Everett Hale.

The fundamental necessity of maintaining "together" belongs deep down in every proposition confronting the dental profession.

Innumerable and unexpected benefits will be derived from the close contact of men whose daily lives of toil and study are none too easy. Harmony between neighbors, fraternity in the local societies, helpful associations in the state meeting, and a broadening influence in the national association will be enjoyed by all who enter the charmed circle of loyal devotees to harmonious and progressive advancement.

'Tis not a marvelous flight of fancy to picture the realization of these ideals.

Doubtless your minds turn to the many hindrances that form stumbling blocks along the pathway of the ethical practitioner. No greater hindrance could exist than for us to fail to join harmoniously in the present day spirit of hearty and proper co-operation in all movements that look toward the strengthening and upbuilding of our profession.

Be not deceived. Never has the world judged so clearly, so impartially. The most vicious standard of success is that which sets up dollars and cents as the height of human ambition.

In the language of the Bard of Avon, "No profit grows where is no pleasure ta'en, in brief, sir, study what you most affect."

For years it has been my lot to mingle with those who sought to promote the growth of fellowship among the great mass of practitioners. If my observation has been correct the happiest, the most prosperous and withal the most useful members of our profession are those whose trend of thought, whose aim in life and whose daily work has given evidence of an unfaltering desire at all times to do right. An intimate acquaintance with many of these noble devotees to the highest ideals forms one of my most cherished possessions. Such pleasant associations are within the grasp of all who prove themselves eligible by standing shoulder to shoulder with worthy confreres.

In no place in the world does the law of the "survival of the fittest" more clearly manifest itself than among professional practitioners judged by members of their own profession. Here and there for a short time the public may be misled and confused as to the proper estimate to put upon the charlatan, but not so with our own co-workers. The slightest deviation from the path of rectitude is easily discernible and there is no escaping it.

'Twas the Immortal Lincoln, whose residence, in this city, left so many hollowed memories, that once described a steamboat that plied the Illinois river, as having a whistle so large that when it blew the engine stopped. The quiet demeanor of the well-trained practitioner who looks to the attainment of higher standards invites your respect and commands your approval—the trumpet blasts and gaudy display of the charlatan are well understood.

Granting the truth of the forgoing statements, how great is the incentive to a closer relationship in the dental profession—a fraternal feeling rich in that harmonious intercourse so full of pleasure to all.

There is no greater evidence of real worth, no more positive proof of learning and ability than a constant desire to concede to our neighbors due credit for their just claims to recognition. They all agree that competent practitioners in hard lines are not to be dealt unjust blows by innuendo or otherwise. This is neither just nor brave. When Prometheus was bound to a rock it was not an eagle but a vulture that buried his beak in the tortured vitals of his victim. All are pressing forward along the same road. The good of each should be an old age crowned with the blessings of life, health, happiness and a consciousness that in our struggle for a competency we may reach the evening of life without having wronged any man.

After all the fundamental question is how we may best attain a proper professional and financial standard without dragging down our neighbors, who in a large per cent of cases, are just as worthy of public support as we.

Patients respect us for expressing good opinions of our neighbor practitioners and there is no possession that we will cherish with greater pride in advancing years than a memory of professional conduct not darkened by harsh criticisms of those worthy of kinder thoughts.

Having for years experienced a close relationship with many of the most capable members of the dental profession and having enjoyed the confidence and friendship of a large number of those who have lifted the light of progress into full view, my appreciation of the worth of our leaders in thought, education and scientific research is the very highest. Students, often without financial support, investigators whose energies have been quickened by a desire to lessen the sufferings of humanity, faithful toilers in the unexplored fields of scientific research, with no promise of reward save the consciousness of a duty well performed, one can not suppress delight at the privilege of standing within the circle of their influence. Is it still necessary to urge you to a closer fellowship, or is it sufficient to recite to you these conditions, believing that an irresistible impulse will draw all right minded men into one common circle of friendship? Let us not forget, in this day of great corporations, giant machinery and multiplied energies, that we are prone to underestimate our individual worth. 'Tis not what you do, but how well you do it that determines the worth of every man.

Just as hardships endured and obstacles overcome by our early predecessors served to kindle the spirit of devotion and self sacrifice, so ought the rare opportunities for education and self improvement of today spur us to emulate their noble example.

As we toil on from year to year striving to elevate the standards of excellence so desirable to patient and practitioner and enjoying closer and closer fellowship with one another. Let us not forget that

"There are loyal hearts, there are spirits brave
There are souls that are pure and true,
Then give to the world the best you have,
And the best shall come back to you.

"Give love, and love to your heart will flow,
A strength in your utmost need;
Have faith and a score of hearts will show
Their faith in your word and deed.

"For life is the mirror of king and slave.
'Tis just what you are and do;
Then give to the world the best you have
And the best will come back to you."

—BRIDGES.

EVOLUTION AND DECAY OF THE TOOTH-BRUSH.

BY G. S. JUNKERMAN, A. M., M. D., D. D. S., CINCINNATI, OHIO.

It is difficult to conceive the origin of the modern tooth-brush if it did not have its birth in the barbaric age. The features of the construction and application of the modern tooth-brush seems to indicate that it has had a history of evolution rather than having been sprung upon the present public in a state of perfection. It was the custom of the wild man of the cave to clothe himself in the skins of such animals, whether wild or domestic, as inhabited the environments of his rustic home. Clothing by him was not appropriated from these animals and applied to himself from a sense of inborn modesty, but rather for the purpose of protecting him from the viccissitudes of the elements. Warming the feet and keeping the head cool became a therapeutic fact only after the healing art had advanced into civilization, yet the principle was used by the wild man just subsequent to the Glacial period, as evidenced by the fact that the feet were covered and the head left bare long before any coverings for the rest of the body were used. In many countries of varying civilization where the natives are anything rather than cleanly about their bodies, the bathing habit is next to a mania with them. Baths by them, however, are not taken for the purpose of sanitation, but with the view of securing the resultant stimulation which the therapeutist knows is possessed by alternating heat and cold.

Since civilization possesses the quality of cleanliness to a more or less degree the imagination based upon some facts must be used to determine when this condition had its origin with our savage forefathers. Priest-craft and the instillation of this principle into the religion of the people would most reasonably account for its existence at the stage of semi-civilization, but possibly some accident must account for the discovery of this quality among the cave-dwellers before the origin of priest-craft. The custom of wearing the fur side of animal skins next to the body excluded the necessity for covering the other side of the hide with a lining as is done in the more civilized age of man. Today when man wears a fur coat, he has the fur side out and covers the other side with something soft to protect the body.

The wearing of the fur side next to the skin as was done by these savage men of the cave must have resulted in a filthy condition of the body and a darkened appearance to the skin. One day, as history might say, some cave-dweller whose condition of poverty or weakness in the chase of wild animals prevented him from securing the furs which are acknowledged to be the richest and most valuable, found it necessary to cover his body with the skin of some domestic animal more easily secured and of less value. He selected the skin of the pig, which was most easily acquired and following out the custom of his fellow-men, placed the bristle side next to his body. By degrees his fellow cave-dwellers took notice of the whiter and cleaner appearance of his skin, and inquiring the cause, discovered it to come from the constant contact of the bristles with his body. That day of discovery was born the first intimation of the modern brush. It did more than this: The hog bristles stirred into animation that dormant Godgiven principle of cleanliness in the minds of these savages. Vanity, therefore, and the principle of evolution has been the potent factor in producing our modern brush. A fair skin is more admired than a dark one, and doubtless was the case with our savage forefathers, and what began as a necessity with the poor pig-skin wearing wild-man followed as a vanity with the rest of his set. Every one began wearing pig's hides to get a fair skin and when those were left off for finer and more civilized clothing, the virtue of hog bristles had been discovered. It does not take much strain of the imagination to see the fair sex of that day using small pieces of pig-skin applied to their faces in performing their duties toward their complexions. A slight transition makes possible in the imagination the origin of the tooth-brush to secure white teeth. Co-incidentally it might be mentioned as a travesty on nature's laws, for a verification of the principle, that extremes sometimes meet when the animal of the filthiest habits, the hog, should furnish a most potent instrument of cleanliness. From these deductions it will be seen that the discovery of the tooth-brush was an accident and not a design. It is, in fact, not even an accident in itself, but rather a variety of an already discovered fact.

All creations of God or man reach the zenith of their power and influence and then defy the principle of absolute rest by still continuing to move rather in a downward than an upward course. If this zenith has been reached in the development of the tooth-brush, it will be a sad blow to the manufacturers of this article, but dentists can not afford to rest without supplying a substitute if the tooth-brush is beginning to fall into a state of decay. That such a substitute is necessary seems to our mind to be a foregone conclusion. As a cleansing agent, we can not deny the tooth-brush the possession of that virtue, but it has many vices which should be substituted for by investigation and the seeking of new principles. The friction of its bristles is too wearing on parts of the tooth structure and its membrane and more so when used in conjunction with the numerous offensive tooth powders. Personally, I can testify to numerous cases of gum recession where it was impossible to arrive at any other conclusion than that of tooth-brush use or abuse. I believe that patients should be instructed in matters of this kind about the use of the brush as it seems to be a principle existing in the minds of faithful patients that if a little is good, a great deal is more good. This principle in the healing art we know to be a fallacy. The frequent and constant scrubbing of the teeth should be guarded against as well as the condition of absolute negligence. Bristles also are puncturing instruments and act the same in the human mouth as hypodermic needles injecting into the gums any germs that may be found in the mouth. Poisonous germs are found in the mouth and might escape again without disseminating into the blood or producing pathologic conditions in the dental tissues if we could refrain from this hypodermic cleansing instrument. Tooth-brushes themselves can not be kept sterilized, as boiling will ruin them and germicides will not permeate the bristles. I believe the most potent factor in producing our present accepted etiology of pyorrhea alveolaris is the tooth-brush. One tooth becomes infected and the tooth-brush inoculates the rest. These facts dawn upon us so forcibly that our tooth-brush treatments seem to assume damageable if not criminal responsibilities. So thoroughly am I convinced of these responsibilities that on numerous occasions I have felt myself perfectly justified in repudiating the use of all bristles in the oral cavity, but again, being called upon to furnish a substitute, I hesitate in my inadequacy to supply it. Bristles and powders, if necessary at all, should be restricted to the cleansing of the rest of the body where they are both effective and scientific. When it comes to a question of using bristles in the mouth, they had better be left on "the hog" and a search made by the profession for a safer and more effective substitute. I have mentioned only a few conditions that may be the result of the tooth-brush habit, the possibilities, however, to the thinking man are far reaching. The introduction of a physician into the family to treat one of the members, history shows at times has resulted in turning the house into a hospital, a hospital not alone of the disease that he was called in to treat. A logical conclusion is that the doctor may become a disease carrier. Civilization has introduced many new dental diseases. Perhaps, the tooth-brush is a disseminator and an originator of these diseases. It has been a matter of wonderment to the profession how so many have gone through life with practically a perfect set of dental organs, who have never had a tooth-brush in their mouths, while others who have been most scrupulous in the use of the brush have had a continuous pathological history. It is a hygienic fact that the teeth must be kept clean to facilitate their preservation, but it is also a proven fact that the bristle is an imperfect instrument for accomplishing such a result in the face of what may happen to the tissues as an after effect of its use. In the game of dental ten-pins, I do not wish to be interpreted as a continuous player, always willing to bowl down the pins, and never wishing to act as pin-boy in setting up new pins to furnish pleasure for my professional co-laborers. There are constructive workers and destructive workers whose labors along the line of progress are necessary to bring about proper results and without them dentistry would sink into an indescribable mass of chaff and grain useless both to ourselves and the public. It will be argued that it would be a dangerous decision to rob the laity of the tooth-brush, thereby bringing about a greater tendency to uncleanliness of the mouth, a tendency which is now too strongly innate in the human race. While I am in full agreement with this hypothesis we can nevertheless do nothing but stamp the tooth-brush as an imperfect instrument for bringing about the results desired and those who work for the ideal in that calling must fully appreciate the fact that they have fallen much short of it when they can send their patients away armed only with a tooth-brush for bringing about an ideal sanitation of the mouth. We should strive to attain that position of dignity equal to the cleansing and sterilizing of the other cavities of the body. When the aural, the nasal, the rectal and vaginal cavities are suffering from disease it is not usually the custom of the physician to place an instrument in the hands of the victim and instruct him how to use it. His dignity and professional responsibility calls him to perform this important function himself. Such a position is not being assumed by those who restrict themselves to the practice of prophylaxis in the oral cavity and no doubt the rendition of their services to the public will go a long way in eradicating the necessity of the tooth-brush and replacing it by something more scientific and progressive. These are not ideas of a dreamer and if they are it is a misfortune that we have not long since all become dreamers instead of unrespected servants as we largely are today. The oral cavity, the most belligerent, the most prone to disease of all the cavities of the body, we permit too much to remain under the care principally of a dumb, inoculative, unsterilized tooth-brush in the hands of an ignorant public, while we with uplifted hands cry out for recognition for more strongly marked professionalism. Our medical brethren have long since been in the field and won their laurels in cavities of no greater importance to the animal economy. We have in our calling a man of culture, though long in service yet young in action and thought, Dr. C. M. Wright, of Cincinnati, Ohio, who advocated the use of the dental nurse for bringing about prophylaxis in the oral cavity. While it was looked upon lightly by some, the suggestion tended to the placing of the cleansing of the mouth and teeth and the combating of oral diseases more closely under the guidance of the dental surgeon and was, I consider, a direct attack upon the present tooth-brush habit.

War made on old idols usually brings to the firing line the grizzly-haired veteran reserves, who, with old and obsolete weapons and superannuated tactics, succeed only in augmenting the pile of ruin already wrought. New idols, however, rise upon the ruin and one more link has been forged in the chain of progress. Customs, "like trees who with deepest roots are still least unwilling to quit the ground," are difficult to change even when experience has proven them to be deleterious to private and public good. Distance has been annihilated by rapid transit, business habits changed by the telephone and now the tooth-brush must take the road of the "has beens" trodden out of the path of science by bacteriological research. A partial substitute has been suggested without any desire on the part of the writer to place a salable article upon the market. He feels amply repaid by being able to bring before the profession and the public an evil to be corrected and will leave it to the prophylactic branch of the profession and to the inventive geniuses to devise a substitute for the tooth-brush, that will accord with scientific research and appease the wrath of those grown too old to have a deep-seated custom easily eradicated.

The writer desires to add to this article the following letter, which will explain itself and which should become, on account of the high authority of its writer, part of this paper. He has given his consent to its publication and I herewith respectfully ask the publishers to print it in connection with this article, as requested by him.

GREENSBORO, ALA., June 21, 1906.

DEAR DR. JUNKERMAN:

The almost universal prevalence of oral unsanity is responsible for most of our dental ills. The tooth-brush is at present the most possible remedy, therefore if condemnation of it gets abroad from such an authority as your pen, there will be a break in the natural line of progress. The time may come, God grant it, when liquid astiseptics, hydration and cotton swabbing only, may be necessary, but, doctor, that thought is for the contemplation of the "very elect" only. I fear that the only feature of your artistic and beautifully written essay, which will develop fruition in the mind of the average man, is that part which pronounces the tooth-brush harmful. If you do publish it and desire to add this correspondence as a foot-note, you have my permission.

Sincerely yours in Dental Prophylaxis,

J. P. CORLEY.

PRESSURE ANESTHESIA AND ARSENIC.*

BY DR. W. E. O'KEEFE, APPLETON, WIS.

The subject of this paper was chosen, not because of any marked ability of mine in the manipulation of either cocaine or arsenic, but because of a lack of that uniform success so much desired in the working of these two very important drugs. Selfish reasons prompted me to select this subject because I felt that a discussion on the applications and steps pursued in pressure anesthesia and the use of arsenic could not fail to benefit me in future trying situations. The question that presents itself daily to almost every one of us is: What shall I do with this or that pulp? Shall I attempt to preserve its vitality or would it not be better for the tooth to get rid of the pulp and thereby head off the extremely annoying results of its subsequent death?

If you decide to remove the pulp, shall you use pressure anesthesia or the sealing in of arsenic to remove the demon with its accompanying tail or tails? Quoting from a paper by Dr. R. A. Adams in the *Dental Summary,* 1904: "Pressure anesthesia is indicated where the pulp can be removed entirely by mechanical means, and contra-indicated where this can not be done. In proportion as the pulps of teeth are difficult to remove, pressure anesthesia is contra-indicated."

The centrals, laterals, cuspids, second bicuspids and frequently the first bicuspids and first molars are best suited for this method, while the second and third molars and occasionally the first bicuspids and first molars can be more successfully treated by devitalizing. We all know that a great many teeth are filled either necessarily or unnecessarily, with a part of the pulp intact, and that it is only a question of time until they lose their vitality, putrefaction sets in and then we or the other fellow have something to contend with, which causes us to murmur unprintable things. I readily agree with Dr. Adams when he says: "If remnants of a pulp are left in a tooth, they had better be left in a devitalized condition than to have them die after the canals have been filled."

---

*Read before the Fox River Valley Dental Society, Neenah, Wis., March 13, 1906.

Living remnants can not long retain their vitality and putrefaction is the certain result, while if the pulp is devitalized and as much of it removed as possible, and then a mummifying paste of some sort pumped down into the remaining portion, and the canals filled, there is less likelihood of future trouble. There is a difference of opinion among dentists concerning mummifying paste. A great many claim it unscientific and say trouble is sure to follow its use, but it seems to me the conditions set forth warrant its use and that it is not only practicable, but scientific as well. Good fortune has not favored me with a view of all the abscesses resulting from my badly filled canals. I say good fortune because I think any dentist who has filled canals with vital parts of pulps remaining and gets that patient back is indeed fortunate. I have not observed hundreds of cases of pressure anesthesia and devitalization for several reasons. But of those that I have tried to handle I found in some cases, after using pressure anesthesia for fifteen or twenty minutes, I finally had to seal in arsenic to complete the operation, after working the patient and myself into a state of nervous prostration. With very few exceptions, my wrestling bouts were with molars and first bicuspids and now and then with an anterior tooth. My greatest difficulty in pressure anesthesia seems to be the getting into close contact with the pulp, that part of the procedure in most cases being quite painful, as well as involving much time.

Arsenic, if properly sealed in a cavity and left long enough, is much more satisfactory to both the patient and operator, unless the case be one of emergency and then no doubt pressure anesthesia is the method to use. We were taught in college to leave arsenic in a tooth from twenty-four to thirty-six hours only. I believe, and am now quite convinced that this limited time given the arsenic to do its work is the reason so many young practitioners are sorely tried by having patients return too soon and upon opening into a tooth, find the pulp still vital or partially so. While at the State meeting in Oshkosh last summer, a dentist told me that it was customary with him to use a small copper disk as a covering after first placing the arsenic in a cavity; then to flow cement over this disk, the latter acting as a rigid roof, preventing the cement from causing pressure and subsequent pain. Sandarac varnish is also used by many operators to saturate the cotton covering the arsenic, thus sealing the latter in the cavity tightly, and also acting as a rigid covering, then soft cement is flowed over the cotton, causing no pressure. Both pressure anæsthesia and arsenic are excellent things to use in their indicated cases, and if properly handled will, no doubt, give gratifying results. My object in presenting this subject to the members is to learn, if possible, by an expression of opinions, a satisfactory method for handling each.

ANÆSTHESIA.

BY W. E. TENNANT, D. D. S., FOND DU LAC, WIS.

Since Horace Wells, a dentist of Boston, discovered anæsthesia sixty-one years ago, there has been a steady advancement along the lines of the relief of human suffering with anæsthetics. Before this time we all know more people died in hospitals or on the battle field from shock than from the after effects of the operation. What a boon, then, to mankind is a drug that will wholly or partially anæsthetize the patient and make him insensible to the pain of an operation.

So steady has been this advancement and so important has it become, that dental patients of today demand, and rightfully, too, that they be cared for with as little pain as possible, and treated in a way becoming the advanced methods and science of the twentieth century. In this short paper I will not attempt to cover the whole field of anæsthesia, but only to give you my ideas on the ones, both local and general, that are practical for, and should be used, by the dentist of this day and age.

LOCAL ANAESTHETICS.

Only a few years ago physicians as well as dentists were deathly afraid of cocaine and kindred drugs; a few, of course, using them, and when we stop to think that cocaine has been used in as strong a solution as 20 per cent by hypodermic injections, we sometimes wonder that we have not had more deaths from its use, as a quarter of a grain has proved fatal. But today experiments have helped us to arrive at positive conclusions, and we also know that the average failure recorded was usually due to ignorance in the use of the drug

---

*Read before the Fox River Valley Dental Society, Neenah, Wis., March, 1906.

used. As far as the local effects are concerned, a 1 or 2 per cent solution of cocaine gives us about the same anæsthesia as a 5 or 10 per cent solution, and the dangers are reduced in proportion to the smaller per cent used.

All the proprietary local anæsthetics on the market, from first to last, depend upon cocaine for their principal drug; this is proof positive that it surely surpasses all other drugs in the whole pharmacopeia in producing local anæsthesia; and I thoroughly believe there is no other drug when improperly used that will cause more distress and alarm.

Eucaine stands next to cocaine; there are two preparations of eucaine, the Alpha and the Beta or the "A" and the "B"; the "B" is considered the safer, having been carried a little farther through the chemical process and hence more pure than the "A." Although less potent an anæsthetic than cocaine, eucaine is only about one-eighth as toxic, and a 2 to 4 per cent solution will give a good anæsthetic effect and with comparatively little danger.

There are many other drugs used as local anæsthetics, but I consider none worthy of any use whatever. I favor using the one drug at a time only, anything we may put in the solution to stimulate the heart, etc., only irritates the tissues and increases the chances of bad after effects, adding no virtues to the formula.

The success with these solutions depends upon (1) pure drugs, (2) pure water, (3) fine sharp needles, and (4) thorough injecting. These conditions complied with, an absolutely painless operation can be performed. Have your druggist weigh the cocaine out in 1-grain papers and the eucaine in 2 or 3-grain papers, and keep these in an absolutely clean place and always on hand. Then take the water, boil thoroughly and filter it into a clean bottle; when making a fresh solution, measure out 100 m. in your graduate, and into this put the contents of one paper; if cocaine, you will have a 1 per cent solution; if eucaine, you have a 2 or 3 per cent solution, according to the number of grains in the paper.

Eucaine must be boiled to get a clear solution, while cocaine is spoiled by boiling; therefore, heat the eucaine solution in a test tube till a clear solution results, then filter into a clean bottle.

In warm weather prepare a fresh solution twice weekly; in cool, once a week. I favor the "Schemmel" needle (it is about No. 29), made by Parke Davis; it is a small needle, made to slip into the shoulder that screws on to the barrel of the syringe; they are cheap and can easily be replaced. The greatest danger is caused by the anæsthetic getting into the throat, as it paralyzes the epiglottis and the muscles of the throat, which alarms the patient and often causes syncope. Have the patient rinse the mouth frequently and at last swallow a little water to clear the throat. An infant syringe should be used to inject cold water in the back part of the mouth, as this thoroughly removes any solution that escapes from the tissues.

A good plan is to hold the ball of the finger over the point to be injected, as less pain is caused in entering the needle and the solution diffuses more readily into the tissues. Plenty of time should be taken in injecting, giving time for the tissues to become white under the finger; this also prevents puffing of the tissues. Have the air in the room cool; a drop or two of cocaine upon the tongue in a warm room will make any of us feel faint. Inject so that the point of the needle will be midway between the mucous membrane and the periosteum. If injected under the periosteum sloughing will surely follow. Have stimulants close at hand in case of an emergency; among the best are strychnine hypodermic tablets, 1-40 grain, 2m. cap. amyl. nitrite, brandy and aromatic spirits of ammonia.

Never return to the bottle any solution that remains in the syringe. When not in use, the needle having been boiled, should be kept in a clean place, a fine wire kept through it to prevent the opening closing, and the barrel of the syringe should be kept filled with an antiseptic solution. If the tissues are wounded, a good mouth wash should be prescribed. Boro-glyceride, oz. 3; Acidi Carbolici, dr. 1, is one of the best; one teaspoonful to a wine glass of water several times a day. In third molars we are justified in using a 5 per cent solution and never use the same needle for regular work that we use in pus cavities. In weak, nervous patients inject around a small area at a time and watch for depressing results, but the fright alone will cause the majority of trouble and not the drug, if it is used properly.

GENERAL ANAESTHETICS.

Somnoforme (1 ethyl chloride, 60 per cent; 2 methyl chloride, 35 per cent; 3 ethel bromide, 5 per cent) is the invention of Dr. H. Rolland, Professor of Anæsthetics and dean of dental school and Hospital of Bordeaux, France.

Having used this drug about six months, I can say it is superior to gas in every way. The main advantages over gas are that it has a shorter induction period and the anæsthesia lasts longer, absence of asphyxia and cyanosis, ease of administration, and costs less. You are all, perhaps, familiar with the apparatus. Indications for complete anæsthesia are: ocular movements cease, soft snoring often ensues. Period of induction averages about thirty seconds; pupils become dilated. Duration of anæsthesia, usually about seventy-six seconds, deepens after removal of face piece.

PHYSIOLOGICAL NOTES.

Conjunctival reflex usually, but not always, lost; pulse increases both in rate and tension; color keeps normal; no cyanosis; absence of excitement in 98 per cent of cases; no swelling of tongue. An overdose may cause headache or nausea. And right here I want to say that it is far better to inject upon the lint a small quantity three or four times than to inject all at one time the usual dose (which is 2½ c. c.), as that way your patient gets a sensation of smothering. Experiments upon animals by Dr. Rolland show that the respiration ceases long before the heart action, hence watch the breathing closely. It can be given to all ages; anemic girls and children take it well, which is not always the case with N_2O. We are more apt to give too much than not enough, which is liable to cause nausea.

Somnoforme from the bottle can not be used without the regular valve made for this purpose, and it is better to have two of these; then, if there is not enough left in one bottle to fully anæsthetize, you have the second in readiness. I cut the end off the valve (that screws into the bottle), then by screwing down into head of bottle it pushes in the metallic cover and it is ready for use; otherwise the threads will not catch, the end of the valve being too long. Use from the bottle entirely. The capsules are designed for warm climates only, and then they contain a certain amount, which usually is not the amount you want for the case in hand.

GAS N_2O.

Perhaps the latest improvement in apparatus is far superior to a gasometer, the apparatus I have used for about four years or until I adopted somnoforme, but I must say I have never felt that it was anything like a complete success only for *very short operations*. The

"Heckard," the "Teeter" or the "Clark" are all very expensive outfits, and while the best there is in the gas line, it costs too much to administer gas in this way; that is, it takes too much gas. I have been tempted to throw my gasometer into the street many times, and even this apparatus is far ahead of the old style bag. I contend that gas is too expensive to use unless you are a specialist in this line and can manufacture your own gas, but we in the country can not afford to do this, unless one man in each town fitted himself for this work and the rest of us send these operations to him.

And right here I may be pardoned if I say, the dentist should wake up and demand a just compensation for such service. The man that will give a general anæsthetic for such a paltry sum as some receive for this service should stop and consider that he has a case of life and death in his hands, then he perhaps can gain a true idea of this valuable service (when properly done) to the patient.

It is my claim that it is the duty of every dentist to either learn to use these anæsthetics properly or send his patients to some one that can perform that operation in the best possible manner; the patient will feel like commending the advance dentistry has made, instead of doing what he can to keep away about 70 per cent of the people, as is now the case, and classing it next to barbarism.

Do you know, gentlemen, that we would have more patients, more free advertising, and of the kind that pays, if we would not become hardened under the daily contact with sensitive tissue; and were we to cultivate a firm but gentle and sympathetic touch, dentistry would be the gainer, and we financially richer? Pain is absolutely the turning point of light into darkness; who of us can see the sunshine of life, or even believe there is such, when constantly attended by pain? But dissipate the pain and the world takes on brighter tints immediately.

Therefore the dentist that does not look for agents to alleviate the pain of his patients is unfit to practice in this enlightened twentieth century. Prove yourself competent to administer these drugs, and your patients will not only give you ample remuneration, but will appreciate your effort, which, after all, doubly pays the bill.

PROCEEDINGS OF SOCIETIES.

THE ILLINOIS STATE DENTAL SOCIETY, FORTY-SECOND ANNUAL MEETING, SPRINGFIELD, ILL., MAY 8, 9, 10, 11, 1906.

DISCUSSION OF DR. LUTHRINGER'S PAPER, "OUR STRONGEST WEAKNESS."

Dr. C. N. Johnson, Chicago:

There can be no two opinions as to the desirability of calling attention to the subject introduced by the essayist, and I am particularly pleased to have the paper presented by a young man. It has too frequently been the case that the younger members of the profession have not thought seriously upon these matters, and that the older members have thought of them only when forced to do so by grim necessity after it was too late to profit much thereby. I hope the men just beginning in practice will study this paper most carefully, and that they will adopt some system—whether this particular system or not—in the conduct of their business affairs.

I am in accord with the plea in the paper that the students in our colleges should be taught something about the business management of an office practice, and for several years have made this a feature of my work with senior students. We should always have a care, of course, not to convey the impression that the business end of dentistry is its chief end. With students it is necessary constantly to hold up the mirror of professionalism as the highest aim for a dentist to attain, and yet without some reference to business the average young man will go out of college to meet the public with a very immature and vague conception of how to conduct his affairs.

As to the relative merits of the card system or the ledger in keeping accounts, there are many ways in which the card system will appeal to the methodical practitioner, but there is one feature of this to which I have elsewhere called attention and which naturally would not suggest itself to a young man starting in practice. That is the element of space taken up by the cards after many years of accumulation. Those of us who have been long in practice and who keep accurate records of our operations begin to realize after a while how bulky our records and accounts become, and this bulk is increased in the card system over the ledger relatively by just so much as a card is thicker than a piece of paper. I should be embarrassed to find room in my safe for a sufficient number of cards to contain the records conveniently held in my ledgers at the present time.

The question of collecting accounts is a very important one for the dentist to consider and sometimes a perplexing one. There is no rule to follow except the one of equity and justice, and this implies justice to one's self as well as to one's patients. It is only common justice to demand compensation for service rendered, and the dentist should form the habit of presenting bills promptly and regularly. An appreciation of the value and extent of the service is more vivid in the mind of the patient immediately following the work than it is a few months later, and the longer the account runs the more hazy becomes the obligation. Going to court to collect a bill is usually unsatisfactory, and yet as a matter of principle it may be sometimes necessary. If courts were always just in their decisions, broad in their judgment, and equitable in their ruling, the conscientious practitioner could, with greater confidence, submit his cases to their care, but a fight in court over a professional fee is usually not a very edifying or comforting experience. The wrangle of the lawyers and the frequent slurs cast at the presumption of professional charges do not raise in the minds of the public a respect for dentistry or lend dignity to the calling. It is better in case of a dispute over fees to arbitrate the case if possible, and let law be the last resource.

Some years ago I wrote an editorial entitled "Collect Your Accounts—Pay Your Bills." It seems to me that the two should go hand in hand and they usually do. Dentists should establish a reputation for paying their bills promptly. They owe this in respect to their standing in society and as a matter of common honor, but they can not be prompt with others unless they collect their own accounts.

I am pleased to see these matters discussed among dentists more generally than they formerly were. At one time it was almost an unwritten law not to bring anything connected with the business end of a practice before a dental society, but the numerous examples we have had in our profession of a man approaching old age without a sufficient accumulation to sustain the burdens of his declining years has forced the subject upon our attention as an important and necessary consideration for the professional man. Simply because we conduct our practice along rational business lines, it does not follow that we must thereby lower our professional standard. The two may go together to consummate a well-rounded and successful professional career.

Dr. W. A. Hoover, Gibson City:

I heartily agree with the essayist that every dentist should have a system of bookkeeping. He has covered the ground very thoroughly. If there is any criticism to be offered, it is in the number of books mentioned. Each one must select a system for himself, and the simpler it is the less danger of the work being neglected.

One thing barely touched on, is keeping a permanent record of the work performed, so that it can be referred to and the particular filling, bridge or crown located easily at any time. Aside from the protection it affords from mistaken or dishonest patients bringing up work not your own for inspection, it is a source of great satisfaction to be able to compare the records with the work in the mouth and learn what kind of work we have been doing.

There is no one thing that will do more to improve the character of our work than by the constant use of this record to discover our failures and faulty work. It may be a good plan to collect accounts regularly and it may even be all right to pay our bills, if we have the money, but it is far more necessary to keep this record, if we expect to practice intelligently and improve from year to year.

We never know what defective work we do until we make use of this record a few years after the work is done.

Dr. B. J. Cigrand, of Chicago:

Mr. President and Members of the Society: I am very glad to see the title of this paper on the program of this society. One thing about these records that appeals to me is not to postpone the making of a record until the latter part of the day or after office hours, because experience will teach you that you very often neglect to put down some work which should have been recorded. I think President Roosevelt's advice in this direction is very acceptable, when he says, "Do it now." Make the record when you are through with the operation, and it is clear in your mind, and not after business hours, as so many dentists do. Again, we do not charge sufficiently for all the things we do. We do many things for which we make no charge whatsoever, and if we do, the charge is so small that it is scarcely deserving of the word compensation. Many an operation is performed, like removing a pulp in a molar tooth that has been treated several times, exacting of us the greatest strain possible, and yet it does not receive even an entry in the book, and we have taken possibly hours of our time in accomplishing it. I think it is very essential that an intelligent and representative body of men, as the Illinois State Dental Society is, should consider more thoroughly the questions that have been brought forward today. If this society could by some method arrive at a substantial agreement about the manner of determining the amount of our fees, and how we could come to an ethical and equitable understanding with a patient, when we went into court to collect a bill, we would be able to give the court similar answers at all times, and it would mean something. As it is, everyone has his own idea about it, and there is a lack of system, and if there is one thing that the Illinois dentists and dentists throughout the country suffer from, it is from a lack of business system, and system is the thing upon which all large business houses thrive. No large business or institution, no banking firm or investment company can thrive unless it has an exact system which is lived up to almost religiously.

I am afraid that he touched the subject of agents a little too lightly. The essayist criticised the methods of the agents who come to us, and rather found fault with the results that often follow from their visits. That is not the agent's fault. It is our fault. I want to say, I have a very kind word for agents. There are few men in this audience who would be carrying insurance on their office furniture, or insurance on their homes and lives if an agent had not come in and convinced them that it was a necessity. If an agent comes to me about something, I do not turn him out. I respect him for what he represents, and I treat him kindly and generously. But I waste very little time the first time he calls. I hurriedly learn what he wants, and if I think it merits my consideration I make an appointment with him. Agents are entitled to that. These agents do a splendid work in this country. If it were not for them there would be very small libraries in the homes of the people of this country. (Applause.) Many a man has received his early inspiration for establishing a library because of a book agent, who has taught him how to get the library.

As regards the question of a business education in a dental college, it seems to me it is getting so that scarcely a paper is read or a subject is talked of but what they say, Why don't the colleges take care of that?

I begin to think that this matter ought to be taken care of by the State Boards. (Laughter.) Let them regulate the prices. It is my opinion that the reason why so many men go out into the world after graduating from dental colleges and do work cheaply is because they are influenced by their early training. Many a boy goes to a dental college who has come from the farm. He has worked hard in the harvest field and at hay time, perhaps earned a dollar and a half or a dollar and seventy-five cents for the whole day. You can not educate that young man in a short time to an appreciation of the propriety of charging eight or ten dollars an hour. He does not comprehend it, and it devolves on us to train him, so that he will appreciate that he is really doing something more for the public than he was when he was out in the harvest field. When he sees that, he will join you and charge higher compensation.

Another reason why we are entitled to fees or compensation that is higher than we are getting is the fact that we are serving the public in a very peculiar way. Only judges of courts and lawyers are beginning to comprehend that the character of our work is different to the class of work done by men who work on material things. We are working on the human being, and we are entitled to the same consideration that law, medicine and surgery are entitled to.

One other point: It is true we need better compensation for our services, so that we may not only pay our debts, but live. We should make it possible for us to occasionally have a week off, so that we can go out into the woods and commune with nature. This will enable us to render better service, because we are better prepared for it, both mentally and physically. The necessity for rest and recreation should be considered.

Dr. E. K. Blair, of Waverly:

I want to add one suggestion or one convenience to the list of books and records that the essayist has named in his very able paper. I speak of this because I have had reason to know the value of it. Some of the mistakes I have made in not giving credit to those who have paid me and have asked them a second time for an account, led me to pursue this course. There came through the mail an advertisement from a publishing house that furnishes all of the necessary materials that are used in banking. I wrote to the firm, and suggested that they send me a sample receipt that I might use in my office to give people when they pay me money. The sample was a nice piece of paper. The material used was excellent, and the printing the best. Typographically, it was very good. In one corner was the name of the town, and a blank place for the date, and in the other corner of the sample my name was printed. Now I come to what I want to speak of. These receipts are put together in blocks of one hundred, and when a man pays $5.00 or $10.00, you can turn to the day book, give him credit, and cultivate the habit of keeping your receipt-blank on your table, and as you give your patient credit on the day book, also give him a receipt for any money he may pay you on account, comparing the two. Then you do not forget to give him credit at the time you receive the money. When you hand him this receipt, it is a neat piece of paper. It shows him that you have the proper blanks with which to do business. I congratulate the author of this paper. I believe if I had been taught these lessons when I first commenced to practice dentistry, I would have $2.00 today where I have only $1.00. Every dentist should strive to keep an accurate account of what he does; he should look over his books occasionally to refresh his mind, and if he is failing to accomplish what he ought to do, it will spur him to renewed effort. It *is* possible to make some wise investments, so that you will not always have to dig and work at the chair and pass through trying hours of the hardest kind of work. In a short time, if you make fair investments of your money, it will materially help you, and when the evening of life comes and you have attained that position where you are compelled to rest, you can look more pleasantly and complacently upon the future.

I have strange ideas about this country of ours. They call it the "land of plenty." I have grown to believe, after years of active service in our profession, that working as hard as we do, when we reach a certain age we should have laid aside sufficient money, so that we can lie down and rest. We are entitled to it. There are many men following other avocations in our communities, who have not put into their work half so much skill, half so much brain force, half so much energy as we have, yet long before they reach 55 or 60 years of age they have a competency.

Dr. J. N. Crouse, of Chicago:

I am glad to see a subject like this discussed. First, I am going to describe an account book I had made of my own. I never found one that suited me, so I had one made. It has diagrams of the teeth, with the roots and all. It has a place to make a charge and to enter your cash account. Those are all in one book. I will give you a pointer about bookkeeping. I have had a young woman for the last twenty-seven or twenty-eight years (laughter) who has kept my books for me. When a patient is ready to leave the chair, she steps in and asks about the filling I have put in. She takes a diagram. I say to her on the side, $10.00, $8.00, $12.00 or $20.00, according to how hard I work, and how much money the patient has got. (Laughter.) I say to these patients lots of times that I am not afraid to discuss the matter of fees with them, telling them they will be a great deal better off if they do not complain about it. Of course, some of them will say, your bills are high, and I tell them in reply that if they had only half as much money as they have, they would be better off (laughter), but as they have so much money, they can afford to pay me well for my services. I talk to them in that strain. I am not afraid to say such things to my patients. On the other hand, I am in a position to render services for much less to worthy patients if they have not the means. This I frequently do.

A word with regard to collecting bills. If there is anything I hate, it is to collect bills. I have my bookkeeper send out the bills. She knows what I want to charge. She knows the number of hours I have worked on the case, and she has a diagram of the tooth or teeth that have been filled and treated, and if I have not told her previously how much to charge, she will ask, how much shall I make this bill out for? I give her the amount, and she sends out a bill from such a date to such a date. Let them complain if they want; they never do it a second time. (Laughter.)

I was notified not long ago that I would probably be called into court on account of a bill because it was said the executors would not pay my bill. This family is wealthy, and they were patients of mine. I permitted the account to run along for four or five years. Among other things, I straightened the teeth of two of the boys—orthodontia, if you please (laughter) and suddenly the head of the family died. I sent in my bill. One of the executors was a patient of mine, and I said to him, as he was in charge of the estate and the affairs of the family, I have a bill against that estate. He said, Is it much of a bill? Yes, it is a big one. He replied, I am sorry, because there is one member of the family who is down on you and they will complain about it. He further added, We will make you go into court and collect it. I made an appointment with an attorney to go in court with me. I took my bookkeeper along with us; I had the accounts in four different books. My bookkeeper was put on the witness-stand, and she was asked, Is not this bill unusually large? She replied, No. Dr. Crouse has as large bills as that very often. Can you show me any in the books? Yes, she replied, and she showed him one account twice as large, that I had collected, and there were one or two others standing on the books. Then the lawyer examined me and asked, Doctor, why have you not collected this bill before? I replied, I did not have the time. I allowed the account to get up so that when I really wanted the money, I would have enough to buy something with. I do not like to have money coming in in little dribs. I am considered liberal with my money. I do not save as much as I ought to do, but I believe I am happier for having helped some other fellow, particularly if I have enough not to depend upon my profession and relatives during my declining days. The lawyer asked, Is that not an unusual bill? I replied, Not at all, sir. I turned to my bookkeeper, and she showed him an account of $5,000 for one patient. I told the lawyer that the brain work I put in on such cases amounted to a great deal; that I used up my nervous energy to the amount of fifteen or twenty thousand dollars. The result was the bill was paid. The Associated Press published this news, so that it went all over the country. It was headed, "The Pullman Dental Bill." I believe it was $2,700. This was commented on to such an extent that the newspapers abused me all over the country for charging such a bill, but it didn't hurt me any.

DR. GEORGE H. HENDERSON, of Springfield:

I want to say a word or two in behalf of the young men either fresh from college or going into a new locality. This young man goes around amongst his professional brethren and tries to find out what the fees are in that locality, and he is very often told that they get such fees as Dr. Crouse has spoken of or some other dentist in Chicago may receive. There is an utter lack of confidence in the profession of dentistry as to the fees we charge, and many men will lie like sixty, when telling young men what fees they get. It is a fact, ladies and gentlemen, and we ought to be more careful. A man told me the other day that a member of this society was making full dentures for $4.00, and claiming to be a good professional man. He was passing through this city, and I asked him if he was coming to attend this meeting, and he said, No. There are so many hypocrites among the members of the dental society in our town that I do not feel like associating with them. What we want to do is to be candid, and above all things, if we can not charge enough in our offices to be gentlemen, we should quit dentistry and dig ditches.

Dr. George W. Dittmar, of Chicago:

So much has been said with reference to the colleges that I want to say a word. I practice a part of the time in the country, and the rest of the time I am engaged in college work, consequently I know a little about both sides of the question.

I agree with what has been said by the essayist and the previous speakers, that the student, when he leaves school, does not know very much about fees, nor does he know very much about business in general. I appreciate the fact that our colleges are inconsistent in their teaching, to a great extent. As the colleges are conducted at present, the students, from the time they enter the infirmary until they leave, learn nothing about price, except that we charge for material used. The college gets twenty-five cents or fifty cents for an amalgam filling, or it gets twenty-five cents for a cement filling, or five dollars for a denture. It is simply a matter of price; consequently when the student goes out to practice dentistry he has had that feature instilled into him. Some of them go to a dental society and hear members of the profession talk. They hear, for example, that Doctor Crouse or some other dentist received $50.00 for putting in a gold filling, or some large sum for a bridge consisting of four or six teeth, and so on. They do not know what to make of this. I have made it a practice in the past few years to give students a talk on dental fees, and I have tried not to go to the extreme either way. I have sent a list of questions to men I know personally all over the country, whom I know to be good, honest men, who would give me a fair answer to the questions I ask; consequently I have gotten price-lists that are fairly correct. Some of them are much lower than others. However, you would be surprised to see the uniformity of the fee list for the various States. I struck an average and gave that average to the students, so that they get an idea of what the fee list is and so an idea of what to charge when they go out to practice.

Something has been said with reference to the business part of our profession and the saving of money. There is more, it seems to me, in making a proper investment than one would think of at first. I believe, that there are no men who are so utterly incapable of judging as to good investments as professional men, especially dentists and doctors, as they are so apt to be carried away with the idea of get-rich-quick schemes. Some promoter calls at the office and talks gold bricks or oil stocks. He will tell you that if you invest in these things your money will not only be doubled, but possibly trebled in a short time. You may get rich in two or three years, according to their story. You are induced to invest a few dollars here and there, and the whole thing does not amount to anything. Once in a while somebody is lucky and makes money, but much of our hard-earned money is lost in that way. I must admit that I have been caught myself, but it is the last time. (Laughter and applause.)

Dr. C. M. Mead, of Carmi, Ill.:

Ladies and Gentlemen—I am happy to say that I was tutored in a college of which Dr. H. A. Smith, of Cincinnati, was dean. The boys all called him "Professor Fees," and I am glad that I was a student in that institution for that purpose, as well as for many others. I do not think the colleges are to blame for not paying more attention to some of these questions. For instance, Dr. Cigrand made the statement that the farmer-boy does not appreciate high fees. That is exactly the reason he leaves the farm; because he can not get high wages on the farm. If a man does not get what he ought to have for his services, he is not going to do what he should for his patients. It takes all of the skill; it takes everything that is good out of a man, if he is not properly compensated, I do not care who he is. If it does not do so immediately, it will do it in time.

I was talking to an eminent dentist last evening, and he said to me, "The skill of every man is maintained by being duly compensated," and I am glad he made that remark. From Dr. Cigrand's remark one would infer that the young man who enters the practice of dentistry lowers the condition. That is an incorrect impression, as a rule. Another man (Dr. Henderson) made the statement that a young man goes around and asks about fees, and the other fellow lies to him. There is much truth in that. When a man starts in the banking or mercantile business, he does it for gain. I do not hesitate one minute to say that I do not get the fees that I ought to get, all things considered. I know my weaknesses. There are many things I can not do as efficiently as other dentists. I do know, however, if I am not being properly compensated in some manner that the life-giving power has all been taken away and I fall short of doing my duty toward my patient. We do not practice dentistry without hope of reward and we should not attempt to deceive the public in our motives. It is true, we are doing it for the good of the public, but we should be paid for it. I do not hesitate to say to a patient that this or that work is worth so much. And if the patient says, "I can get it done for less than that," then I reply, "It is your privilege, and you have the liberty to do so." A gentleman came to my office to have some work done. He said, "What will this be worth?" I told him $250.00. He exclaimed, "My God! I wish I didn't have so many teeth." (Laughter.) I said to him, "In my estimation, God Almighty made a mistake when he created you. He should have made you a sheep." (Laughter.)

Dr. George W. Haskins, of Chicago:

We should be able to deliver the goods before we deserve the money. We can not hold a man up and say to him that this or that job is worth forty-five or fifty dollars unless we can give him its value in services.

System in business is very essential. But why should we as dentists expect God Almighty or the people of the United States to look after us in our old age if we do not look after ourselves? There should be system in saving as well as earning. We should conduct our practice on business principles, and in accordance with business methods. If you do not do it yourself, nobody in this world will do it for you. There is no reason why, because we have elected to follow dentistry as a profession, we should expect the Deity or any one else to look after us if we do not do it ourselves.

There are two ways of taking care of savings. One is life insurance, which I believe is usually followed by the professional man, who should take out a policy as early in life as he can, when he is in the best physical condition and the rates are lowest, not taking out an old-line policy, which will not do you any good, whether living or dead, but the ten or twenty payment policy payable at some specified age. In ten years take out another one, so that at the expiration of the first, if necessity demands it, that money properly invested will take care of the second. He can carry that policy, so that in later years it will reasonably take care of him. Another way a few men follow, and a good way, is to lay by their savings monthly or yearly, the same as they pay their rent or building and loan dues, and invest them under the advice of some man who knows how. You nor I do not know how to make judicious investments. Invest them under the advice of some one who knows, and be satisfied with four and a half or five and a half per cent. Follow that policy through life, and you will end all right. In short, let us look after ourselves and not expect anybody else to do it for us.

Dr. Arthur D. Black, of Chicago:

It is to be regretted that the title of this paper did not give a more definite idea of what was to be presented, because the subject is a very important one to every man practicing dentistry, and the author has given us an excellent presentation of it.

Before I took up the practice of dentistry, I spent five years in business between the time I left college and the time I entered dental college. Since then I have been thankful for it, because it enabled me in the beginning of my practice to adopt some definite business methods.

I want to mention two things in connection with my system of keeping records that may be of interest. First, the examination cards. Instead of using a tablet or a slip of paper on which to record examinations, I use a card. These cards are filed in alphabetical order for future reference. I make it a business, and it is the business part of the record I want to speak of particularly, to keep on that examination card a record of any understanding I have with the patient of a financial nature at the time I make the examination. Frequently a patient will ask something about the cost of what I am going to do for him. I make a memorandum of what my reply is at the time, so that there can be no misunderstanding afterward. I can say to the patient, "I have examined your mouth, and I have noted down here certain things you need to have done. Possibly there will be other things that will need to be done, things that I do not now see, but what I have put down here will cost about so much. If there is other work to be done, it will cost more." Having had that understanding with the patient beforehand, future misunderstandings on account of added fees will be avoided. Many times you may put in a single filling and the patient will need a four or six teeth bridge, and he may ask what the bridge will cost. You may tell him $50.00 or $100.00, or whatever you think is right, and possibly the patient decides not to have the bridge made at that time. Two or three years afterward that patient may return to you and again bring up the subject of the bridge. Here is where the value of filing these cards comes in. Before I see each patient I look at the previous examination card. It is picked up instantly. I look it over, and I have fresh in my mind everything that was done at the previous sitting, and I do not make the mistake of giving him a lower price if he asks about anything a second time.

The other item of which I wish to speak is the monthly record of receipts and expenditures. I keep these on one card, four by six inches in size, for each year. I put down the total amount of business done, the amount of cash received, the amount of discount allowed, and the balance due at the end of the month, also my expenses, divided into three different groups, so that at the end of every month I know how I stand.

I want to say a word or two in regard to the dental colleges. Dr. Cigrand said something to the effect that they should not be expected to teach business methods. I do not think any man can successfully practice dentistry unless he knows the business part of dentistry, and the dental college should teach all these things. The dental college should teach students how to keep perfect records of the operations they perform in college, so that when they graduate they will know how to do it. They should also teach their students that there should be no comparison of prices charged by the college with fees charged by dentists, and that many operations performed free in schools, such as treatments, should be charged for as their importance demands, by the practitioner.

Dr. Truman W. Brophy, of Chicago:

I desire to congratulate the Society on having a paper of this kind presented to it at this time. I feel that it is only right to say that young men of this trend of mind, exhibiting such capacity and energy along professional lines, are safe men to leave the interests of the profession to in the years to come. I suppose some men here may say, as they have said in the past, that when a question of this kind is up for serious consideration on the part of professional men, they are indulging in what is commonly called commercialism. The word commercialism has been so abused in connection with professional affairs, and especially in college matters, that it at one time grew to be equivalent to the term disgrace. Today in this great Society, the largest of its kind in the United States, and the largest in the world except the British Dental Association, which has a larger membership, we are discussing the subject of commercialism in a way, and it is essential that it should be done. How true have been the words of those who have declared that some members of our profession pass along through life and in old age are dependent upon their neighbors and friends, or their professional brethren, for support. Is it not right, then, that we should discuss questions that bear upon our individual affairs, the comforts of old age, the care at the time in life when we are no longer fit to perform our professional duties? I believe it is one of the most important of all considerations.

A question that has not been mentioned by the gentlemen who have preceded me bearing upon the matter of fees, the matter of getting on with our professional affairs, is that of consultations. Now, gentlemen, the condition of the student in the dental college does not differ from that of the student in the medical college. I have been through them both. I know what it is to work in the medical dispensary and to care for patients there. I know how patients come and how they are cared for, and what we were obliged to do during the years I spent in medical infirmary work to induce people to take the medicine home. Now, the patient goes to a dental college and gets services practically free, and it is known to every man who knows anything about it at all, that the dental college infirmary is not as much a source of revenue as one would think. In the dental infirmary they have the same experience they have in the medical infirmary. As a rule, they deal with poor people. I have seen patients come to the medical dispensary with sealskin jackets on and wearing diamonds, seeking to get free medicine. It is the same in the dental infirmary. On the Pacific Coast today there are women elegantly gowned, with diamonds, who have not a dollar. Who is going to take care of them?

A mistake frequently made by dentists is in not receiving proper compensation for the hours of work they spend in treating patients. Is it not more of an expenditure of energy to destroy a pulp, or to clean out a tooth canal that has a dead pulp in it, and get it in an aseptic condition and properly fill the canals than to put in any filling? The dentists of our State and of our country are spending much of their energy in doing this kind of work, in advising patients, and getting practically nothing for it. That should be stopped.

Dr. G. E. Warren, of Pontiac:

There are two items I wish to speak about. First, system which is absolutely necessary, but the more simple the better.

The time is coming when we will leave our offices for the last time. We may not know that time, and someone has to take our books and settle them. Therefore, accounts should be kept in a systematic way, and as simply as possible, so that other people can understand what we have been doing. I had a little experience of that kind when one of the members of this Society, known and loved by the older members, died. Dr. Pyper and I succeeded in the business. We spent night after night for two or three weeks in trying to straighten his business affairs. We did the best we could, but, in my opinion, the widow lost hundreds of dollars from the fact that the accounts were not kept up-to-date. I try to make it a point never to go home until my books for that day are posted.

Another thing is with reference to fees charged by young men of which Dr. Cigrand spoke. Sometimes it may be the fault of some of the older members of the profession. I am going to relate a little incident in my own life to illustrate that. When I was about to graduate, I felt I could not start an office of my own, but was told that a certain practitioner wanted an assistant. I went to see him. He made me this magnanimous offer: His office hours were from 8 a. m. until 9 p. m.; Sundays, from 10 until 4 p. m. He would give me $12.00 a week for rendering services during these office hours with the expectation that at the end of six months, if my work was satisfactory, I might get $15.00. (Laughter.)

Dr. Luthringer (closing the discussion):

Dr. Hoover spoke of the complicated system of ledgers I have. I spoke about two ledgers. Perhaps it is a misunderstanding on his part. Of the two ledgers referred to, one is a purely business ledger, and it is not a complicated system at all. In fact, I think the system is simple. But I realize, too, that we all have little procedures that differ one from the other.

Dr. Blair spoke of having a receipt book. That is a very good idea. There are numerous little details of the work of the system I have not mentioned. Perhaps I would find a place here and there where the system was weak, and adopt some other procedure. On the other hand, you would doubtless find some other spot that would appear a little weak to you, and you would adopt some plan to strengthen that weakness. I brought up this subject in the Peoria Dental Society about those men who impose on us, and it was surprising to see the number of dentists present who held up their hands who had been deceived and had been imposed on by agents.

I took that as an evidence of what occurs in other communities. There is a legitimate field for agents, and there are legitimate agents. They are all right, but there are others who make it a business to impose upon professional men, and those are the ones I requested you to guard against.

I feel sorry for the man whose only aim in life is to make money. I think that is about the poorest aim a man can have. Of course, it is true, that at the foundation of all our efforts there is the idea of recompense, but we must not consider it the only thing or the highest thing to strive for. (Applause.)

In closing, I wish to thank the members of the Society for their forbearance and for the kind consideration that they have accorded me, and the gentlemen who so ably opened this discussion, and also my thanks are due to those who have taken part in the general discussion.

DISCUSSION OF DR. J. W. RITTER'S PAPER ON "SOMNOFORME."

Dr. J. A. Bullard, of Chicago:

I am very much interested in this subject of the use of anæsthetics in dentistry, as I am called upon to use them a great deal in my work, and would like to bring into this discussion a comparison between somnoforme and nitrous oxid gas, as there have been several articles written for the journals, of late, upon this subject.

This substance called somnoforme, according to its manufacturers, is composed of three very volatile liquids, namely, ethyl chloride, methyl chloride and ethyl bromide, any one of which will vaporize at body temperature, and inhalation of any of these vapors will produce a short period of insensibility or anæsthesia.

Ethyl chloride and ethyl bromide have been used in years past, more or less extensively, by the medical profession, where a transient anæsthetic could be used, or as a starter for ether. The chloride of ethyl is used more for these purposes, the bromide being now employed but sparingly, as there are several fatalities recorded as resultant from its use, attributed to the difficulty of always obtaining a pure article which does not contain some free bromine, and bromine when vaporized and inhaled is a very marked irritant of the respiratory and gastro-intestinal tract, and complications brought about by these irritants have resulted in death following its use. So clinical experience would show that we are not using an entirely harmless combination.

My own experience with somnoforme is that it is useful in very short operations, such as the extraction of deciduous teeth, or operations upon adults where you can accomplish results quickly, but if you try to prolong the anæsthesia by carrying it on until you have a slight snoring, or administer it a second time, the patient, upon regaining consciousness, will usually be nauseated and depressed for a considerable time. In my own case, after inhaling somnoforme my feeling for forty-eight hours could be best described as like that resultant from a combination of tobacco and seasickness.

It would seem to me that a great deal of the after-sickness from somnoforme is caused by ethyl bromide, as I have used ethyl chloride alone and got about the same working period, but seldom the nausea.

In comparing somnoforme with nitrous oxid, the working period is about the same when nitrous oxid is administered by the old method of using the Lewis or face inhaler; but if the nasal inhaler for nitrous oxid is used, there is no comparison between the two, for with this method of giving gas, you can keep your patient under its influence as long as you wish, or long enough to accomplish any dental operation. Nitrous oxid can be given a second or more times without any ill effects. Before the nasal inhaler came out, I gave gas to a man fifty-six years old eight times in an hour with no bad results, using the face inhaler.

The patient regains command of his faculties more slowly in coming from under somnoforme than from under gas; consequently is more stubborn and will swallow more blood. This also is a factor in producing nausea.

The points particularly in favor of somnoforme and those which seem to be giving it favor over gas, are that it is easier to administer, can be given without an assistant, the apparatus is cheaper and supplies less expensive. With nitrous oxid, an assistant is necessary to operate the valve of the cylinder, to get good results, and incidentally necessitates a third person being present at the operation. This is a point being very much overlooked, especially by young men who are putting in the simple apparatus, and which will bring trouble sooner or later; for a patient may have only been unconscious a few seconds, and think she has been asleep an hour, and has been through experiences detrimental to the operator.

Nitrous oxide is more expensive. Taking the average susceptibility of the different subjects to its influence, you would get about six administrations from a hundred-gallon cylinder of gas, which costs two dollars. This applies to the nasal method of inhaling, which takes more gas than the face inhaler, as it is being consumed all through the operation. This costs about thirty-three and one-third cents per patient. Somnoforme, providing you can get results with 3 cc. tube, will cost twenty-five cents per patient.

Although nitrous oxid is a more expensive material, it is also an agent which has the clearest record of any anæsthetic in use today. The few fatal results which are charged against it occurred principally in its early history, when the manufacture of the gas was crudely done and contained impurities. I have given nitrous oxid over fifteen hundred times in the last five years and never had any bad results that a stimulant, such as a little brandy or ammonia, would not overcome. But it matters not how often an anæsthetic has been given by one person, the next one using it may have fatal results.

Look at the history of chloroform—probably the most potent and dangerous anæsthetic in general use today. Dr. Hewitt says he has used it for thirty years, by having the patients inhale its fumes from a wide-mouthed bottle until the first effect is established; that is, the peripheral sensory nerves are deadened, but the reflexes are active and consciousness not lost—supposedly the most dangerous time to inflict pain, and still he has had no trouble. While a certain school of medicine teaches the giving of chloroform by excluding air entirely, instead of with the orthodox 96 per cent air, producing almost instananeous anæsthesia, and they claim it the safest method of administering the drug, still the majority of fatal results come from operating too soon or crowding the anæsthetic too fast.

Somnoforme certainly has a remarkable record, considering the number of times it has been given, and the recklessness with which it has been used by dentists who are using it with no other thought than they can put the patient to sleep, extract a tooth and get the money; and as the essayist has said, giving no thought as to what they would do providing the patient did not wake up.

Dr. W. A. McKee, of Thompsonville:

This paper by Dr. Ritter has been very interesting and will no doubt serve to make us more careful when using somnoforme, an anæsthetic which has recently gained so many enthusiasts in the dental profession.

To the enthusiast in dentistry we owe much. The wave of enthusiasm which has accompanied the introduction of somnoforme has not been without its good results.

The recent fatalities in using somnoforme should not cause us to discontinue its use and cast it aside as utterly worthless, but should stimulate the profession to a more careful study of it and the best means of restoring a patient when alarming symptoms present themselves. Having never had any accidents in using somnoforme I can not speak from the standpoint of experience, but I always keep ready for immediate use the restoratives, nitro-glycerine, amyl nitrite and strychnine, but am pleased to say that I have never had occasion to use them. I believe that somnoforme is a valuable anæsthetic, but not without its dangers and limitations.

To know just what we are using, its physiological effect, and just what to do in case of danger are things we must know when using any anæsthetic and these points have been very forcibly presented by Dr. Ritter in his paper.

Dr. George D. Sitherwood, of Bloomington:

I have been much interested in this paper. I administered chloroform as a student in a hospital in Philadelphia when I was studying medicine. I have been using nitrous oxid gas for twenty-five years, and I think I know something about the administration of anæsthetics. I bought a somnoforme outfit at Buffalo last year, and have been using it ever since. I am glad to have heard this paper, as it so nearly corresponds with my own experience. I have had two cases, one of which was almost identical with that of Dr. Ritter. I have seen people die, and I do not easily lose my nerve, but I had one patient to whom I administered somnoforme who came near dying on account of loss of respiration, which gave me a very uncomfortable feeling. Because of that fact, I am ready to say from my clinical experience that somnoforme is a good agent to use, when administered carefully, for short operations, but I do not feel that I am ready to administer it for long operations, or if the patient has to be under its influence for any great length of time.

Of the two cases I have mentioned one was alarming. In this case I resorted to artificial respiration, and administered as a stimulant the aromatic spirits of ammonia. I have had a few cases of gas anæsthesia that were slightly alarming, but were not to be compared with those of somnoforme. I feel that the little glass tubes of somnoforme should only be used, because in both cases referred to, one of which was alarming, I used a large bottle. I would like to ask Dr. Ritter whether he used a large bottle or little tubes?

DR. RITTER:

A large bottle.

DR. SITHERWOOD:

He has told you of the liability of the drug to deteriorate, and I will say that I think the drug in the bottle which I used had become partially stale. Because of that fact I would not advise any gentlemen to attempt the use of somnoforme unless he uses the little glass tubes. There is no difference in the expense so far as I know in using gas, if you have the gas apparatus, or somnoforme. For a period of twenty years I have kept an account of administering gas, and the average for one hundred gallon cylinders is eight administrations, with perfect anæsthesia.

I want to emphasize what the essayist has said, that there is danger in the use of somnoforme. My long experience in administering anæsthetics shows that there is more or less danger attending all of them. You can give somnoforme using a small quantity for short operations. I have found it very fine indeed for such operations, but

I would not advise anyone to attempt prolonged anæsthesia with it.

DR. TRUMAN W. BROPHY, of Chicago:

There is one general principle that may be laid down regarding the administration of anæsthetics from which we can not deviate, and that is, no matter what anæsthetic may be employed, whenever we bring a patient into the state of unconsciousness, we are on dangerous ground. No one ever administered an anæsthetic with safety. I deplore the expression that is so frequently employed by manufacturers and their representatives that certain drugs or combination of drugs that are made up and sold may be used with absolute safety. There never was such a thing, and never will be such a thing, as absolute safety in the administration of any anæsthetic. (Applause.)

I know nothing about somnoforme, yet I have always looked upon it, as I do upon other new things that come to us with flourish of trumpets, with suspicion. I am willing to await the results from the administration of this new agent. I hope the time will come when an agent will be discovered that will be safer than anything which we now have. We know what ether will do; we know what chloroform will do, and we know what nitrous oxide gas will do, but we can never tell when we use four or five drugs in combination which one is doing harm, and consequently we can not tell exactly what to do to counteract the evil effects.

The young man has read a most excellent paper. He has put the subject before us in an energetic way, so as to impress us all with its importance. When we think of the evils that may come from a want of knowledge of this combination of drugs, which he has clearly shown, it behooves us to be cautious. I will give the young man credit, so far as I know, for presenting, for the first time, as a professional man, a lucid explanation of the combinations which enter into this agent—somnoforme—and stating what the injurious effects of each may be when used separately.

I want to take up a moment more to point out some of the conditions we encounter and some of the means which we employ to counteract the toxic action of anæsthetics. I am administering anæsthetics every day of my life in hospital practice, so I am in touch with them all the time, and I know the dangers of them, and I have never had an anæsthetic administered that I did not feel that the patient might go, even with all the precautions we may observe and the facilities at our command to counteract the dangerous influences. It is a state of mind, I believe, every man should be in who uses them.

In the first place, in the dentist's chair there is great danger by reason of the position; therefore, the chair should always be placed in a reclining position, or as nearly as possible in that position, when an anæsthetic of any kind is administered. The sitting position is objectionable, because we place too much work on the heart. The reclining position makes it easier to maintain the circulation, and also to maintain the activity of the nerve centers of the brain, and thus stimulate the circulation, and especially the pneumogastric nerve. The dangerous symptoms that come through the administration of nitrous oxide gas would be the discoloration due to the retention of carbon dioxide, which is not freely eliminated. Then, we should make use of plenty of oxygen, having a cylinder of it at hand, which will overcome the effects of the excess of carbon dioxide in the blood. If we use chloroform, we will notice the pallor of the face. This will convince the experienced anæsthetist that danger is approaching, and he should make use of active measures to bring about a normal circulation. My experience is that the best thing to do under such circumstances is to invert the patient, put the head down and feet up. Artificial respiration is a good thing, but far less valuable than inversion of the patient. The patient may be taken (if there is sufficient assistance at hand, and the operator should have a strong vigorous assistant, better two, so as to be able to handle the patient with greater satisfaction) and inverted, more particularly in the case of a child, and we should make use of the most violent means possible for us to do in this fashion (demonstrating), so as to carry the blood by means of force to the nerve centers, stimulating the pneumogastric nerve, forcing the abdominal viscera against the diaphragm, thus assisting respiration, and consequently bringing the patient back more quickly than we would be able to do if we allow the patient to lie in the prone position. An agent which I have always at hand is the aromatic spirits of ammonia, placing it in a little glass, and using one teaspoonful to about one ounce of water. This is always ready, so that if there is a tendency toward cardiac failure, showing defective heart action, let this tube be placed over the mouth and its contents dropped into the pharynx. The vapor of the ammonia is thus carried into the lungs, and is quickly absorbed, coming in contact with the mucous membranes quicker than you can tell it. The mucous surfaces, white, through lack of sufficient heart force, are changed as the heart's action is recovered, and the healthy color of the membrane is restored. While strychnia and brandy should be at hand, I rely more on the aromatic spirits of ammonia than all other agents. I rarely use other agents. But principally, let the position of the patient be correct. I should have said at the outset that we should first lift out the tongue so as to free the trachea, as in this way respiration may be carried on. With the patient lying upon the back, with everything else going on favorably, the tongue may drop back into the pharynx and literally suffocate the patient. The tongue, therefore, should first be lifted, and we should make use of the aromatic spirits of ammonia, together with the violent shaking I have indicated, and almost invariably the patient will come out all right. I have never lost a patient from the administration of an anæsthetic. I will say, however, that a patient died from the administration of an anæsthetic by a physician; I was busy with the operation, and he was giving the anæsthetic. But under the administration of anæsthetics over which I have had charge, thus far I have never lost a patient. I have had patients collapse; I have had them stop breathing, and the heart's action cease, but the agents I have given them and the means I have used have brought them out all right. Those are the simple means we may always use to revive a patient. Do not be deceived by these new remedies. In our dental and medical journals sometimes we will see agents advertised that are "sure cures." Do not be deceived. Do not allow any one to thrust upon you an agent that you do not understand. Be scientific men. Do not permit yourselves to be misled into the belief that a certain agent is safe because the manufacturer of it says so. There is no agent which is a sure cure for anything. Nature does the curing, and we as dentists assist nature.

Dr. C. R. Taylor, of Streator:

I think I was a little misunderstood in discussing the paper that was read by Dr. Pruyn. I want to say to the young practitioners here that they should follow the advice of the older men and not administer and experiment with these new anesthetics for extracting teeth. Study the proposition about giving anesthetics to allay pain in saving the teeth. I tell you, my brothers, thousands and thousands of teeth have been sacrificed and are being sacrificed because it is easy to lull pain by giving an anesthetic to extract teeth. As far as most of the older practitioners are concerned, you may have to search in the scrap pile to find a nitrous oxide gas outfit and a somnoforme outfit. There is very little need in the dental office for these appliances to do away with pain in extracting teeth. Our mission is to save human teeth and restore them to good condition. A thorough study of these appliances and anesthetics will help you to do that, without danger to life. But do not take human life into your hands, young men. But I say to them that when they go out of college they should not buy a nitrous oxide outfit. Wait. Do not do it. Wait. Do not buy a somnoforme outfit. Wait. Buy the things that will inspire you to be better fitted to *preserve* human teeth and not to *extract* them.

Dr. J. P. Buckley, of Chicago:

It was not my intention to discuss any of the papers on the program, but I wish to say a word or two in connection with this paper. The thing that developed local anesthesia was twofold. When Rudolph Matas and C. P. Pruyn, our own member, and other men whom I might mention in this country and Europe, were experimenting with that new drug—cocaine, even though care was taken in the technique of administration, alarming symptoms were produced and there were some fatalities, and that drug which today is so valuable to us in making the practice of dentistry painless would have been discarded if it were not for two factors associated with the administration of general anesthetics. One of them was that nearly every patient objects to being made unconscious by the surgeon for an operation, and will do almost anything if they can get the same thing accomplished in the end by means of local anesthesia rather than to be kept in an unconscious condition. The other factor which entered into the development of local anesthesia was emphasized by Dr. Brophy. Every honest, conscientious surgeon of experience knows that in putting a patient in the condition of unconsciousness they are assuming a great responsibility, and none of them will administer a general anesthetic if local anesthesia will suffice. Those two things, objection on part of the patient to a general anesthetic, and the responsibility of the surgeon or the anesthetist have developed local anesthesia. The laity today are demanding from the members of the dental profession painless dentistry. They do not demand that kind of painless dentistry which we see advertised along the street, the celebrated State street in Chicago, but they are demanding painless dentistry in fact, and the only way that we can practice painless dentistry is by the judicious use of anesthetics, but we should know what we are using and use them with discretion.

Dr. P. T. Diamond, of Chicago:

Those who have been using somnoforme, I am sure, will feel like discarding it as an anesthetic after having heard this paper. Now the danger is that they will be inclined to take up ethyl chloride, as it can be administered with the same cheap apparatus. We should not as dentists take up and use every anesthetic that is brought before the profession as though we were forced to do so. Ethyl chloride, if used alone, is better than somnoforme, for the reason that it is safer. But there is no good reason for using either of them. Nitrous oxide is an anesthetic that is good enough for anybody, either physicians or dentists, especially for short operations. I use it in very much the same manner as Dr. Bullard has described and never have any alarming symptoms such as somnoforme often produces. I can not see any reason for dentists going outside of the use of nitrous oxide unless we use oxygen, which can be employed along with it, and in that way we are enabled to prolong the time of operation. Nitrous oxide is used almost entirely by specialists for the extraction of teeth, their experience proving that there is practically no danger where it is administered properly, which can not be said of somnoforme.

Dr. Ritter (closing the discussion):

I shall be brief in closing. In Dr. McKee's argument he stated that this substance should not be thrown aside after the consideration given it by the essayist. I do not wish any person to go away from this meeting with the feeling that I am condemning somnoforme for all time; but I do want you to understand that I did not realize until I had taken up the consideration of this subject from an analytical standpoint that there were not only young men, but men of mature years, men who have been practicing dentistry for twenty and thirty years, with whom I came in contact, who were somnoforme enthusiasts. How many of these men are prepared to safeguard themselves against the dangerous symptoms that may arise? How many of them have the necessary restoratives at hand? I am not throwing bouquets at myself, because I happen to have them at hand, but I do know there are men who have gotten up in district dental society meetings throughout the State of Illinois, and I have visited a great many of these societies in the eastern and southern part of the State, who have said that they have no more fear of this substance than so much water. And may God have mercy on them. Such men are not fit to administer any anesthetic. (Applause.)

Dr. Sitherwood brought out the point in regard to whether I administered this anesthetic as prepared in a bottle or in capsule form. The point he wished to make was that this agent is liable to deteriorate with age.

There are two other factors which should be considered in connection with somnoforme. If we consider the fact that the large bottles may have been on the shelves of the manufacturer for weeks, or maybe the country practitioner only uses the anesthetic once a week or once a month, then the point he made is a good one. But in regard to the capsules, I wish to say we must ever bear in mind that bromide of ethyl, as stated in my paper, is a lethal substance. It is dangerous. It is also liable to deteriorate after distillation under the influence of heat or light.

The question may have arisen in the minds of many of you regarding the feelings of the operator in this special case. I do not wish to prey upon the feelings of this organization, but I want to say that if I ever passed through two hours of hell, I had it that day in December. I did not consider that I was taking undue chances in regard to this patient, or liberties that were not permissible in administering this anesthetic. I had present two assistants, one a graduate dentist and the other a young lady, who has been my assistant for some time. I was attacked in one of the local society meetings to the effect that I lost my head. Well, I may have done so, but I am glad of it if I did. At any rate, I did not lose my patient.

Another thing which entered into this special case was the fact that the young lady came to my office alone. There was not one member of her family present, and the other factor was that she was the daughter of one of my most intimate friends. I thank you.

THE ODONTOLOGICAL SOCIETY OF CHICAGO.

A regular meeting was held February 13, 1906, with the president, Dr. J. E. Hinkins, in the chair.

Dr. L. S. Tenney read a paper entitled "Some Experiments with Gold."

DISCUSSION.

DR. E. J. PERRY:

I do not know that I can discuss this paper intelligently because I have had no experience whatever either with Keeton gold or with Moss fiber gold. I have used foil most of my life, and I have used Watts' crystal gold almost exclusively of late. I have a notion, which has been growing on me, that my fillings with Watts' gold are not as good as those I have put in with good old foil, and I have mentally resolved that I am going back to foil. I shall not abandon Watts' crystal gold entirely; I shall use it to start my fillings around the margins, and for the finishing I am going to use foil. I tell you, every once in a while I see fillings that were put in by the old-fashioned operators, hard-working fellows who used foil, and they stand up very smooth and bright, and, it seems to me, they bring the blush of shame to my work with Watts' gold. But I have fallen off somewhat in the character of my gold filling work in making gold inlays and porcelain inlays, and I have not kept up my ambition with regard to my gold fillings as I should. This confession is perpectly honest; but I am free to admit that I have not put in, in the last three or four, or possibly five, years as much labor in all my gold fillings as I should have done. I do not know whether inlay work has injured operative procedures in gold or not generally, but to be honest perhaps in my own practice it has. I have an abiding faith in a gold filling, and it is my earnest desire in practice, as in everything, politics, morality, etc., to be symmetrical, to let each thing have its place, to let each article, each idea in life in the place where it will do the most good. Certainly a porcelain inlay has its place, and in its place it is incomparable to a gold filling. A gold filling in turn has its place, and in its place, and with its indications, to my mind it is incomparable to an inlay. A crown the same way. All these things must be determined by the individual operator, who must be honest with himself, because having to depend on his own ability he will be able to apply these things. A gold filling in Dr. Johnson's hands may come out beautifully; in my hands I might do better with an inlay there. I must do for the individual case that which I can do best.

The experiments that have been detailed by the essayist have been very interesting to me. I did not suppose there was so much difference in the specific gravity to compress crystal gold as compared with foil. I am very much surprised at that. I do not see anything else in the paper that surprises me besides that. That one feature certainly appeals to my mind with great force.

Dr. W. B. V. Ames:

All I care to say in connection with this paper is to ask, How many gentlemen in using crystal golds have taken advantage of the ease of adaptability of some of these forms of crystal gold to a cavity by using them in connection with foil or heavy gold, placing a mass of crystal gold relatively in position, and over it a mat of foil or plate of rolled gold to facilitate the carrying of the crystal gold accurately to place en masse without the chopping up that is apt to occur in my hands with any form of crystal gold? It seems to me there is a saving of time and of gold, and facilitating of the packing, by using alternate layers of crystal gold and foil in some form, combining in this way the virtues of foil and crystal.

Dr. L. L. Davis:

I have been very much interested in the topic for discussion this evening. I watched the recent clinics given by members of the Chicago-Odontographic Society, and also those given by the Alumni Association, and it has seemed to me that the gentlemen who gave clinics demonstrating the use of Keeton gold selected cavities that were easily get-at-able, using large foot-pluggers, etc., and so were able to press a mass of crystal gold, or Moss fiber gold, or Keeton-Williams gold down into place. I have used small instruments. I have been using Watling pluggers for years, and I could not get any results from one of those. During the whole of my twenty-one years' professional experience I have had prejudice against crystal gold, for the reason that I think anyone who devotes his operations entirely to the use of some one of these golds loses his manipulative ability, his manual dexterity, and capability of handling foil in putting in a filling, and so long as he can put in a foil filling well he can put in any of these other fillings well under the circumstances indicated. Certainly the fillings shown at some of the clinics I have referred to by the different forms of crystal gold have been beautiful, but, as a rule, they have been used in building up of cusps or the filling of a flat circular cavity in a tooth. They have not cut out the sulci and filled around curves of any length, with a somewhat narrow width. One could not get Keeton gold into a cavity of that kind. They did not demonstrate that kind of work.

The essayist this evening has demonstrated more than ever that the only gold for one to use is foil gold. It shows its value and usefulness in its specific gravity; also in its capability of resisting pressure, and what he has said only confirms my opinion more strongly that foil is the thing to use. It is possible, as Dr. Ames has pointed out, that some one of the crystal golds, in places difficult of access, where you wish to put in a gold filling by hand pressure almost entirely, and possibly without the use of the rubber dam, where you want to put in a large mass in quick order, may be used in the manner in which he has indicated. But for any cavity which has to stand the stress of mastication, or anything that would tend to abrade its surface, the only thing to use is foil in these cases, and you will find that where you see these fillings there is pitting or a smallpox appearance in nine cases out of ten, showing that the operator has been using crystal gold instead of foil. If foil is used, as it is taught in the schools at the present time, and as it was taught in the schools when I attended college, we would not have the fillings that we sometimes see. I am still more in favor of the use of foil after listening to this paper, because it confirms more and more my impression as regards its value.

DR. ELLIOTT R. CARPENTER:

We are indebted to the essayist for the proof he has given us this evening in connection with the superiority of foil gold over any of the crystal golds. So far as my own experience is concerned, I have never had much pleasure in using any kind of crystal gold. I have tried all of them as a matter of duty, including Keeton gold; but in my own hands I can accomplish everything with unannealed foil that I can with Keeton gold or any other crystal gold, and I think in quicker time.

Personally, I am very grateful to the essayist for the exposition he has given us tonight.

DR. J. H. WOOLLEY:

I do not know that I can discuss this subject in the way that Dr. Tenney has done, because I have not tested the various forms of gold in that way. The only test I have given gold has been in my practice. In the use of all crystalline forms of gold the proper way of handling it is in the very smallest granules, you might say. You can not fill teeth with any form of crystal gold rapidly; you can not make a weld. At least, that has been my experience. At one time in my practice I used crystal gold for five years. I studied its use as Dr. Allport advised, namely, get the gold, use the same gold, and master it. I tried to do so with crystal gold. Then I spent nine years in using White's gold, and then I spent a number of years in using Williams' gold. After using crystal gold for a number of years, and I use a great deal of it today, I began to use non-cohesive gold with cohesive gold. I found in difficult cavities in bicuspids, proximal cavities, that the use of non-cohesive gold in the gingival region was followed by less decay. The main idea in using any kind of gold is to mold the filling to the cavity. In crystal gold you can not adapt it so perfectly to the walls as you can with the foil. I made a little test with the Keeton gold and with the foil as best I could, and found when I tried to bend the Keeton gold it broke, and there seemed to be crystals formed in the breakage. It did not seem to be so well condensed as the fillings I made with foil, and it seemed to have welded, and it is a principle in all gold fillings that when the filling is in the cavity it is there as though it was melted and dropped into the cavity.

There is another thing with regard to Keeton gold that is not clear to my mind, and that is as to whether it is made spongy and porous through a chemical process or not. I know that years ago, when we used to make crystal gold, we got the gold into a chloride and precipitated it with oxalic acid, when there was a crystalline form, and after water was allowed to pass through it for hours it was put in the muffler and heated. It seems to me that a filling made in that manner was not as perfect as a filling inserted with the crystal gold of Dr. Watt.

DR. TRUMAN W. BROPHY:

About the time I entered upon the study of dentistry there was a great deal of discussion as to the relative merits of crystal gold as it came from different manufacturers, and gold foil. I remember very well hearing Dr. Allport tell the story of its introduction when he was still living in Syracuse, N. Y. He was intimately associated with Dr. Ambler, of that city, one of the pioneers in dentistry of New York State, whose experience he related in employing this gold in his practice. It was certainly very alluring because it seemed to be more easily manipulated, and as it was called plastic gold its name seemed to attract many to its use who had previously employed foil. It was absolutely devoid of that quality which gentlemen regard as plastic. So popular did it become, however, that many of the better men in the profession began to use it. They noticed that in a year or two some of their very well finished fillings seemed to undergo what was presumed at that time to be a change, though later it was demonstrated that the gold had not changed materially, but in their manipulations they had failed to make tight fillings. As a consequence they leaked and the moisture imparted to the teeth a dark color. A year later Dr. Ambler declared that this gold had not come up to their expectations, and while this was true in a way, it had led them to be a little careless in its manipulation. It was easy to place a block of crystal gold in a cavity and then condense it, as they had supposed, in a satisfactory manner, although they had really become careless in its use, and while Dr. Allport had not at that time used it, he spoke of this defect, and yet, he said, with proper care it might be used without discoloration occurring a year or two later.

In this city Dr. Honsinger, a man eighty-two years of age at this time one of the old-time practitioners, used crystal gold at least forty years of his life, and now and then we see one of his gold fillings which remains very satisfactory. I really think Dr. Honsinger was one of the most skillful manipulators of gold in every form I happen to know.

The work Dr. Tenney has done with the greatest of care and greatest of precision will make a deep impression upon men who are inclined to drop into the general use of this form of gold, because he points out by his experiments the dangers that the dentist will encounter in its use. As we speak of the iron and copper periods, so there was a crystal gold period when the dental profession ran after it and used it almost to the exclusion of other forms of gold. That period passed away, and we came back to foil, and it seems that dental practice, like many other great affairs of the world, comes along in cycles, and so foil has come back to us again. I think crystal gold has its place.

I sometimes think of the beautiful work that was done by Uncle George Cushing, and of the beautiful finish he put on his fillings. They were not done with crystal gold, nor with No. 4 gold foil or cylinders, but they were done by the use of heavy gold. If I were to mark out a plan of filling teeth with gold which would stand down through the decades and perhaps generations, I would do like this: After the cavity was prepared in what is now regarded as the proper form, having a square base, I would start my filling with crystal gold of some form, or the crystalloid gold, any form that could be adjusted in its place and condensed solidly at the base, because it can be done with quite as much if not more ease than with foil itself, then carrying along the filling with gold foil from the gingival border toward the occlusal surface, and finishing with heavy gold. The gold Dr. Cushing used at one time was more like gold plate, carefully cut so as not to have kinks in the folding, but very smooth, and placed in position just about the right size to reach across over the surface, and condensed accurately with fine serrated pluggers, and then, when finished and the surface polished down, it was a solid mass of gold absolutely free from pits and the indentations to which Dr. Davis has referred, with absolutely perfect borders. Such is an ideal filling, in my opinion. Crystal gold is not going to be discarded, nor will foil be discarded. But there is danger of a recurrence of the mistake that was made in the days of Dr. Ambler by dentists in forgetting the true merits that foil really possesses, and which has been demonstrated to us by half a century of work. It is not wise to lay it aside for the purpose of using some of the newer forms of gold which are open to the same objections that were urged in the days of Dr. Ambler.

Dr. C. N. Johnson:

It is very difficult to discuss the significant points brought out in this paper without a careful study of the tables, and particularly one of the tables that has not been enlarged, and that is the table of specific gravity. It seems to me that is a significant table to study, and I only wish we had that so that we could study it on the wall as we have the other tables.

There was one question raised by the essayist I want to refer to. He said that, according to his experiments, the strength of foil was greater with the same manipulation than the strength of the crystal gold. Is that correct, Dr. Tenney?

Dr. Tenney:

Yes.

Dr. Johnson:

The question was asked whether it is not true that the crystal golds gave us sufficient strength for practical work in the mouth. I want to say that if there is one thing that gold does require in its usage in the mouth it is the element of strength. We may put fillings in certain places in the mouth where they have not a great deal of strength, and still those fillings do good service. Where we have a filling that is subjected to the constant stress of mastication in the comminution of food we want the greatest strength, the greatest density and hardness we can get to that filling. I do not believe that in the selection of these filling materials we should ignore the particular position in the mouth in which we are placing fillings.

As I understood the essayist, he said he put in these foil fillings by making a rope and cutting the rope into cylinders. Is that correct?

Dr. Tenney:

Yes.

Dr. Johnson:

There is a factor to which I desire to call attention, namely, I believe with that particular method of manipulation we place foil at a disadvantage. In the making of ropes, where we are attempting to get the greatest strength to a filling, I believe we will get a better result if we use foil, putting in cylinders or pads, by which the layers of foil have an even regularity, so that they may be laid on the filling in a symmetrical manner. If the filling is prepared in that way we are less likely to get air holes, and more apt to have a filling of high specific gravity.

One thing that surprised me was the high specific gravity obtained by the essayist in his manipulation of the foil. It seems to me his manipulation must be very perfect, because in operations in the mouth in the testing of old fillings that were removed years ago, Dr. Black found that they ran along much lower on the average than the specific gravity obtained by the essayist. I believe the highest specific gravity Dr. Black found in an old filling was something like 18, and that was considered a very high specific gravity. I believe that a filling of less specific gravity than that will do service in certain locations in the mouth, but there are other locations in which we want the highest specific gravity for the best service. If these tables are true, the real place for the crystal golds is mostly in those positions where there is little stress or wear of mastication.

Dr. Ames asked the question, Why can we not carry crystal gold in place by a layer of foil? As I understand it, the idea is to carry crystal gold against the walls of the cavity by reason of the pad of foil over them to prevent penetration of the plugger through the crystal gold. There is one element of danger in that with the average operator, and it is one objection of all others I have in a general way to the use of crystal gold, and that is this: In doing that we are likely not to have as much strength if we allow the crystal gold to come to the margins. There is the weak point with crystal gold; they do not give the same strength to given bulk, in ordinary manipulation, over enamel margins that do the foils. Let me give a good illustration of that. I saw a filling shortly after the first wave of crystal gold came along. The filling was inserted by an enthusiast in the use of crystal gold. It was in the mesio-occlusal surface of an upper bicuspid. The cavity preparation was perfect; the body of the filling was satisfactory, but along the entire margins there was disintegration of the mass which left a ditch and led to failure of the filling. We do not frequently find that particular failure with gold foil.

Now, Mr. President, when we come to the ultimate, it is a matter largely of personal equation and a man's individual adaptability to the material itself. In connection with what Dr. Brophy has said with reference to Dr. Honsinger's fillings, I have seen some of the fillings that that man has inserted with crystal gold that are doing as good service for his patients as I have ever seen from the best operators with foil. But I believe, however, it requires a particular manipulation whereby the mallet impact must of necessity travel through every particle of the mass to get density. Crystal gold gives the impression all the time that you do not need to manipulate it as carefully as foil. On the contrary, if you get good results it means that it must be manipulated more carefully than foil.

Dr. J. G. Reid:

From 1884 to 1892 I used Williams' crystalloid gold exclusively for the filling of teeth. During that time I gave quite a number of clinics on the use of crystalloid gold, and I have been fortunate enough to see some of those fillings today—a few of them, and those fillings are doing the work that it was intended they should do, and they were put in all sorts of places. I am not saying anything about the fillings I have put in that others have observed. I used this gold largely for contour restoration, and the reason I employed it at the time was the fact that it was a time-saver. I thought I could put in a crystalloid gold filling in about half the time I could a foil filling. It is true, I had failures with crystalloid gold, the same as I have had with any kind of gold I used. Somehow or other, perhaps by intuition, I felt in my own mind that it was not the best thing to use after I had employed it about eight years. Why, I can not tell you. I abandoned its use, and since that time I have used foil exclusively, that is, from 1892 up to the present time. I do not use crystalloid gold at all, nor do I know anything about Watts' crystal gold. I never saw Moss fiber but two or three times in my life. I have never handled it.

With reference to what has been said with regard to specific gravity and compression, I think Dr. Tenney has gotten at the right idea. He has gone at this subject in a scientific way, so far as getting at the specific gravity and the flow of the metal under pressure are concerned. That is what it is—flow of the metal. There is in this matter the question of the molecular condition of gold. The molecular construction of foil is different from that of crystal gold. They are not the same thing. The molecules of the foil, if we are able to see them, and it is said they have been seen with the naked eye, are found in strings; they are in ropes, like drawn wire. The strength of the foil under such conditions is much greater, much more capable of being adapted than one that is broken up into a minute crystalline substance. Hence, I think it accounts very largely for the condition we see presented in the tables. There is a difference between wire drawn out and a wire hammered out. There is a difference in its malleability. These golds are made by chemical conditions. In the other way, while they are chemically pure, they are manipulated differently, and for that reason it accounts for the condition brought out in the paper. It is the molecular construction of the substance itself, the body of it.

Dr. George W. Cook:

Personally, I want to thank Dr. Tenney for his excellent paper, and for these tables.

As to the use of gold in practical work, I have used crystal gold, Watts' gold, and the Moss fiber gold quite a little, also the foil. I have found by some experiments I made that it was impossible to condense crystal gold in a way that it had the same molecular conductivity as the foil gold, somewhat explaining the point just brought out by Dr. Reid, that the molecular arrangement of the material differs. These tables further indicate to me that we do not know very much about gold. Dr. Tenney's paper illustrates about as nearly as anything I have ever seen the necessity of studying this matter from a scientific standpoint. The molecular arrangement of crystal gold, and in the form of sheet gold, means that we can not get that molecular arrangement in gold after it has been broken up chemically, and then attempt to reunite the molecules again by purely physical means. In the experiments I made the stress of the fillings differed very much more in their power of resistance than do those of Dr. Tenney, inasmuch as I was never able to make as good a condensation as he has made in any of the fillings. I am a little weak in my hand. I do not believe that any one can make as perfect a margin with crystal gold as he can with the foil gold. I do not believe it is possible for anybody to do that; while I think it is possible for some dentists to come nearer to that point than others, still I do not believe it can be done with any of the crystal golds I have had anything to do with.

I have not tried Keeton gold. I never saw any of it until tonight. But if it is different, or if it is better than other forms of gold, I am glad we have got a suggestion as to its value.

This is the best paper I have ever heard read on gold fillings in my life.

Dr. J. G. Reid:

I would like to ask Dr. Tenney if the pieces of gold he used were uniform in size?

Dr. Tenney:

They were nearly uniform throughout.

Dr. Reid:

That, to my mind, brings out some variation in the condition as given in the tables of compression. The condensations would be different, depending somewhat upon the pellets of gold that were used in the cavity; but if they were uniform in size, that still adds a little more to the mystery of why that variation should occur in that particular case.

Dr. Johnson:

I would like to ask if the mallet blows were counted? Have you any idea relatively whether the same number of mallet blows were used in the different preparations of gold for insertion, with similarly sized pluggers?

Dr. Tenney:

I inserted the fillings with view of having the same blow applied to each form of gold.

Dr. Woolley:

I would like to ask if Dr. Tenney could not in his line of experiments find out the specific gravity of melted gold in one of these steel cavities, so as to make a comparison between the malleted gold and the melted gold. I would like to see how near we come to a perfect condensation of the gold.

Dr. Johnson:

I believe he mentioned that in his paper.

Dr. Tenney:

The specific gravity was 19.13 in the case of foil inserted with heavy mallet blow.

Dr. J. E. Hinkins:

The question of gold is a big field. I first began with Williams' gold and with Morgan's and Hastings'. I then took up Watts', or Moss fiber gold. Then I tried soft gold of various kinds, and after this tin-and-gold. Later I tried crystalloid gold. In short, I think I tried them all, and I had failures with many of them. For the last three or four years I have used almost entirely gold foil, which is still Morgan & Hastings' gold. I have had my successes and failures with Moss fiber gold. I have used a great deal of platinum gold. But what brought me to my senses about gold more than anything else was a study of the force of the jaws in mastication. It was found that a person in chewing could use about three-quarters as much force as they could lift with the body. That convinced me that crystalloid gold would not stand the necessary pressure, and so from that day I went back to the use of gold foil. Foil gold is a fibrous gold, which is like the end of forged steel. Crystal gold is a crystalline substance just like cast iron. There is a difference in golds that are porous. In a foil gold the molecules are closer together; they are more compact.

Dr. Tenney (closing):

I have not much to say in closing. What appealed to me most in the discussion was Dr. Cook's remarks that we did not know very much about gold. The more I experimented with gold, the more surprises I met with; one thing in particular attracted my attention. Why, with these different forms of gold, do they weigh out less when inserted with light mallet blow than with hand pressure? I do not believe the hand pressure was greater than the pressure I exerted with the mallet, although it may have been.

In regard to the flow of gold, referred to by Dr. Reid, my understanding is that gold has none of what we term flow. Amalgam has a distinct flow, and under continuous blows will continue to change form. One filling of gold foil, for instance, under two hundred pounds pressure, compressed one one-thousandths of an inch, but we might continue to apply this pressure without further compression.

Gold will compress so far, and then it will remain stationary, unless greater pressure is applied. We need all the strength that we can attain in a filling. I found by a testing machine that I could bite readily a hundred and fifty to a hundred and seventy-five pounds. We do not realize how great is the masticating force of the average person. If we bite suddenly on a bone or other hard substance then we realize the great power we are exerting by the muscles of mastication.

I only regret that I was not able to make a thousand experiments instead of sixteen, because by making a large number we might have arrived at a more satisfactory conclusion.

There was one point that was not brought out with reference to the crystal golds, and that is their property of absorbing gases. That, to my mind, is a great weakness in crystal gold. Being of a spongy and crystalline nature, they absorb gases more readily than foil, and those gases are not as readily driven off by heat as the gases that gather upon the surface of foil gold.

RECENT PATENTS OF INTEREST TO DENTISTS.

826,818. Dental tool. James H. Abbott, Philadelphia, Pa.
826,922. Tongue support. Elmer E. Davis, Los Angeles, Cal.
826,629. Cord suspension electric dental engine. John V. Trenaman, New York, N. Y.
826,977. Dental swaging device. George J. Weber, Liberty Center, Ohio.
827,507. Dental instrument. Lyter H. Crawford, Philadelphia, Pa.
827,508. Dental swaging instrument. Lyter H. Crawford, Dallas, Texas.
827,236. Combined rubber dam clamp and holder. Harald J. Hansen, La Crosse, Wis.
827,308. Toothbrush holder and sterilizer. David M. Hitch, Lansdowne, Pa.
827,693. Hypodermic syringe. Frederick W. Korb, Cleveland, Ohio.
827,121. Tooth cleaning device. Patrick F. Roach, Westfield, Mass.
827,965. Toothbrush. Gregor Engel, Charlottenburg, Germany.
828,109. Apparatus for stamping and shaping dental metal crowns. Adolf Grunstein, Budapest, Austria-Hungary.
828,146. Forceps. James Somers, San Juan, Cal.
827,824. Dental articulator. Frederick W. Stephan, Chicago, Ill.

Copies of above patents may be obtained for ten cents each by addressing John A. Saul, solicitor of patents, Fendall building, Washington, D. C.

THE DENTAL REVIEW.

Devoted to the Advancement of Dental Science.

PUBLISHED MONTHLY.

EDITOR: C. N. JOHNSON, M. A., L. D. S., D. D. S.

Subscription price $1.00 a year including postage, to all parts of the United States and its possessions, Cuba, Canada and Mexico. All other countries $1.75 a year.

EDITORIAL.

A CERTAIN PHASE OF PROFESSIONAL ETHICS.

It would sometimes seem as if dentists overlooked a very important professional obligation in their treatment of the patients of other practitioners who chance to fall into their hands temporarily in an emergency. The code of ethics is somewhat specific as to what is a man's duty under such circumstances, but there are too many in the profession who are either ignorant of the code or else wittingly violate it.

When a patient who is regularly the patron of one dentist is obliged to go to another in some emergency, such, for instance, as a lost filling, a broken bit of enamel, or the toothache, while the family dentist is absent from his office, or while the patient is traveling, the duty of the dentist thus applied to is self-evident. He should relieve the temporary disability so that the patient is protected from injury or discomfort, and then refer the patient back to the regular dentist. This seems so plain, so equitable, and so in keeping with all that is ethical and honest that no one need do what is wrong through ignorance.

And yet it is too often the case that the dentist, when appealed to for temporary relief, does not scruple to take advantage of the patient's disability and insinuatingly search out all the ills, real or imaginary, which he can find in the mouth, and then proceed, if the patient will allow him, to do the most expensive work he can.

The really unfortunate part of this is not the financial loss to the regular dentist, but the creation of a suspicion in the mind of the patient that the dentist has been lax in his attention to the teeth and has overlooked much necessary work. Not only this, but frequently great injury is done the patient in the performance of work which the judgment of the regular practitioner, based on a long observation of the patient's teeth, would have guarded against. No one knows so well what is best in a given case as the man who has conscientiously studied the mouth for a number of years, and it is frequently a case of "fools rushing in where angels fear to tread."

A typical instance of this was related to the writer by a careful and painstaking practitioner, who is noted for his vital interest in his patients' welfare. A gentleman had a lower incisor, which for many years had been somewhat loose, but had been retained with comfort to the patient by a little attention during occasional periods of soreness. On one such occasion the patient was away from home and applied to another dentist for temporary relief, reciting to him the history of the case. The new dentist assured the patient that there was no need of the occasional disturbances, that the case could be readily cured permanently, and finally persuaded him to have the tooth extracted, replanted and banded to the adjacent tooth. The patient returned to his regular dentist in six weeks to have the band removed, under the impression that a permanent cure had been effected, and with the intimation that he regretted this had not been done before. The regular practitioner said nothing about the advisability of the operation, but suggested that the band be allowed to remain a little longer. After a few more weeks the patient insisted on the removal of the band, saying that the tooth was perfectly firm and comfortable. In a very short time the tooth began to drift out of place and had to be banded again. In less than a year it was lost, despite the most strenuous effort to save it.

The operator who replanted it probably did so with the best intentions, but there is said to be a certain very undesirable place that is paved with good intentions, and under the circumstances the dentist who was applied to for temporary relief exceeded his duty in such a radical procedure.

It is, of course, true that no dentist should see a patient suffering from manifestly wrong treatment on the part of the regular practitioner without taking the means of remedying the difficulty, but this is a different question from the one we are considering. Probably the most prevalent abuse is the tendency to crown teeth for transient patients without warrant. It so frequently happens that teeth which have been serviceably preserved by filling for years by the regular dentist, and which might be saved for years to come with a slight repairing of the filling, are ruthlessly slashed off and crowned the moment the patient falls temporarily into the hands of another. This kind of treatment is not only wrong in practice, but wrong in principle, and it has grown to such proportions as to constitute a serious reflection on the integrity and good judgment of many in the profession. It would be well if some of our practitioners were to study more carefully their true function toward transient patients, and live up to the spirit of professional and fraternal equity and justice in their treatment of them.

DEATH OF DR. C. R. TAYLOR.

It is with profound regret that we are called upon to announce the death of Dr. C. R. Taylor, of Streator, Illinois, which occurred September 13, 1906. Dr. Taylor was one of the foremost practitioners of the State, and a man we can ill afford to lose. He was at the time of his death a member of the Illinois State Board of Dental Examiners and his work in this capacity was always marked by ability of no mean order and by a high sense of his duty to the profession and the people of the State. He was an ex-president of the Illinois State Dental Society and was noted for his untiring zeal in the organization and support of local societies in his district. To the young practitioners in his vicinity he was like a professional father, and did more to foster good fellowship among the profession than any other dentist in the State.

He was a man of the loftiest ideals, always contending for what he believed to be the highest and best in human nature and looking broadly beyond the limits of self into the wider range of a common brotherhood of man. It is seldom we see in professional life a man of his breadth of intellect or his liberality of sentiment. Altogether he was a lovable man, filled with a high purpose and carrying this out to the best of his ability in his daily life. THE DENTAL REVIEW extends its sympathy to his stricken family.

ANOTHER VACATION.

GETTING STARTED.

It was one of those sweltering, muggy days in July. The preceding weeks had been crowded to utter suffocation with the pressure of many duties, and this last day before vacation seemed interminable. What a foolish, feverish haste comes over a man on that last day! What a panic of fear possesses him lest something may yet transpire to prevent him from getting away! It seems almost certain that the elevated train must jump the track that morning and land him in the hospital with a broken leg—or worse. When he snatches a few minutes for a rapid-fire luncheon he imagines the food may be poisoned, and thus lay him out indefinitely—or definitely. There is not a single mishap in the entire category from barber's itch to a ham of pork falling on the baby that may not occur that last day. All of which is, of course, only an indication of over-wrought nerves, keyed to a tension too high to be normal.

Fortunately for me, that last day was a very busy one. No matter how much previous planning or preparation one may make, there is always a congestion at the end—which, as I have said, is fortunate. Fortunate, because to be busy is a panacea for most of the small ills we encounter. It helps to dispel the nervous apprehension and makes the heat less noticeable. In fact, you seldom hear a real busy person complain much of extremes of temperature. Grumbling about the weather comes chiefly from people who have little else to do than to watch the thermometer. There are, to be sure, exceptions, but I think I have observed that the more leisure a man has the more critical he becomes of variations in the weather. To my notion all weather is good—some kinds better than others, but all serving a useful purpose and all capable of enjoyment by those who have weightier things to bother about.

But this last day was finally done, and as the family tumbled into a cab and started for the steamer there was a sense of relief that needs no description to those who have ever experienced it. It was the same old party that traveled so far together last year—the Mater, my Indian Girl, The Collector, myself and one more—Elizabeth. Elizabeth added greatly to the party and although she occupied so much room that I was obliged to ride up on the seat with the driver and the grips, yet we couldn't have thought of taking a vacation without her. Elizabeth, in fact, was the sensation of the trip and claimed more attention than any other member of the party. It will therefore seem necessary to describe her. Elizabeth stands about four feet tall in her stockings. Just how old she is I do not know. I always hesitate to ask young ladies their age. She has a full-moon face, large black eyes, much like my Indian Girl's, light curly hair, and an impediment in her speech. This latter is written without the knowledge or consent of The Collector, who would righteously resent it. To her there is no imperfection in Elizabeth. She is the apple of her eye and the one altogether lovely.

Steamer "Missouri."

As we were standing on the dock, waiting for the trunks to be checked, the captain came up and, seeing Elizabeth beside The Collector, turned to the latter and said, with a twinkle in his eye: "Have you got a ticket for her?" pointing to Elizabeth. "I don't see how we can take her without a ticket." The Collector snuggled Elizabeth a little closer to her and looked up at the captain as much as to say, "Well, if you can't take Elizabeth, you can't take me, so there." The captain smiled, chucked Elizabeth under the chin and walked on. When we went on board the children all flocked around Elizabeth and paid her so much attention that The Collector finally took her to the stateroom and put her snugly to bed. One great virtue with Elizabeth is that the moment she is laid down her eyes close and she is sound asleep. Sit her up and she is wide awake. She doesn't have to dig her fists in her eyes to wake up, as some children I have seen. And then she never gets sea sick. Altogether, Eliabeth was a great comfort. It is true that everybody stared at her most outrageously and the remark was frequently overheard: "Well, did you ever? That's the biggest one I ever saw." But Elizabeth never seemed to mind it.

We were leaving Chicago on the good ship "Missouri" of the Northern Michigan Transportation Company, and a more delightful prospect than this for the beginning of a vacation can not be imagined. I have been up and down the Great Lakes in all sorts of craft from the veriest old wooden tubs to the most exquisite of the floating palaces that now ply these waters, but I have never enjoyed myself more than I have on the "Missouri." This was my second trip on her and I have formed an attachment. She is a model in every way and one of the staunchest and trimmest crafts of her size I have ever seen. She is built of steel, is 287 feet long, with spacious cabins, promenade decks, and light, well ventilated staterooms. Her main saloon and dining hall are in ornamental birch, her upper cabin is white and gold. All in all, she is a beauty.

And then her officers and crew. I have made something of a study of steamship officers and I have found there is as much difference in them as there is in—other people. Many of the captains I have seen seem to hold the theory that in order to be efficient they must be always stern, severe, reticent, churlish and able to swear lustily. I don't know whether Captain Finucan of the "Missouri" can swear or not, but I have never heard him and I have made several voyages with him, even before he commanded the "Missouri." I have seen him smile hundreds of times and I never saw him fail to pass a pleasant word with a passenger. I also have the feeling that in time of danger the ship and passengers would be as safe in his hands as if he were continually heard cursing his men. As with the captain, so it is with the entire crew down to the cabin boys. They are all courteous, accommodating and gentlemanly.

What is more restful after the heat and fever, the smoke and noise of a big city, than to be gently cradled on the spacious bosom of Lake Michigan with the cool and invigorating breezes sweeping along the steamer's decks and stealing into the staterooms to fan one to sleep? It is growing dusk as we swing out past the mouth of the river, and by the time the outer light is reached the shades of night are beginning to creep down over the surface of the gently heaving water. I never before realized how beautiful and wierd Chicago harbor is at night. The thousands of shore lights reflected back in the water, the dim outlines of the buildings making it appear like a phantom city in the haze, the numerous craft, going and coming, all brilliantly lighted with that modern miracle—electricity. It was a sight worth traveling miles to see, and here we have it at our very doors and do not look upon it once a year.

We sit out on the deck, snuggled in a family group, till the winds have fanned our drooping eyelids nearly shut, and then we rouse ourselves, yawn a bit, look out over the darkened waters, take a full breath of the purest air and go to our staterooms. Elizabeth is tucked carefully in beside The Collector, and it is difficult to say which slept the sounder that night. The next morning we awaken as we are entering Ludington, Mich.

(*To be continued.*)

PRACTICAL HINTS DEPARTMENT.

EDITED BY G. W. JOHNSON, D. D. S.

[This department is for busy readers. We want short articles containing practical ideas—the shorter the better. No article must exceed 200 words, unless of exceptional merit. Every dentist has some useful hint that has been of value to him, and if he will only put it in print it may be of equal value to others. That is what this department is for. Due credit will be given for every article sent. Address G. W. Johnson, THE DENTAL REVIEW, 55 State street, Chicago, Ill.]

Finishing Gold Fillings:—Gold burnishers and marginal trimmers are instruments of great value to the dentist. The cavity filled, I burnish it thoroughly and trim away all overhanging gold prior to using strips or disks. For the lingual surfaces of anterior teeth I prefer a fine carborundum disk or point, of small size to cut away all excess of gold, and follow this with sandpaper strips and disks.—*J. B. Taylor, Marshall, Ill.*

Baking with Mica Door Furnaces:—A simple, but accurate method can be used for baking in mica-door furnaces. A soapstone wall is placed between the porcelain and the door and a one-quarter gold cylinder is used to indicate the required temperature. The porcelain should receive the highest heat behind the wall, but the position for the gold varies as if on a scale between the side of the muffle and the end of the transverse wall. The gold is placed nearest the porcelain when comparatively low temperatures are sufficient, but the distance is gradually increased as higher temperatures are required. —*C. M. Baldwin, Chicago.*

Remedy for Use in Treating Deciduous Teeth;—In my hands the most satisfactory remedy is a solvent or digestant, manufactured by a reliable firm, not commonly accepted as a proprietary medicine, known as Caroid Solvent—a permanent solution of vegetable proteolytic ferment. Following the use of this and at intervals of several days, while sealed in the cavity, the tooth may be filled, but it is often well to prepare a vent by puncturing the tooth on the buccal surface. Should our efforts fail after this procedure, rather than extract the tooth, it is often desirable to remove all the crown portion with a bur and allow the roots to remain.—*Grafton Munroe, Springfield, Ill.*

Resistance in Electric Furnaces:—In regard to the introduction of resistance in the electric furnace, I have an idea that there are too many buttons, too many points, put into the resistance. I can not see any benefit in throwing a current into a wire gradually. A platinum wire when cold is in the best possible condition to carry the current. It is strong and healthy. Throw the full current into the wire and it is perfectly able to stand it, because it is a cold wire and it can not get excessively hot until its surrounding material is heated up. It can not come to an excessive temperature because of the close contact of the conducting materials that bind it to its side.—*W. H. Taggart, Chicago.*

The District Society:—The District Society is made up of individuals who are not only associated in a common profession, but being drawn from a compact territory have interests which are of a closer nature than those from communities widely separate. We have in addition to general matters those which are of a local interest. Some may think it a waste of time to give the small society attention. Well, if it is because they are confident of knowing more than others, the society needs them and there are few men after being in practice for any length of time that have not something original. Some of us have originated mistakes the recital of which would be of value.—*Guy F. Corbey, Mattoon, Ill.*

Mouldable Dental Porcelain:—No ready-to-wear crown can be perfectly ground to fit the root end. Where a facing is used with a post, and a base or floor of platinum, and porcelain is added to the lingual side, as in incisors, cuspids and bicuspids, the platinum base not only does not absolutely fit the root end after the crown is baked, but the metal base does not adhere to the cement. These cases may all be fitted or refitted with mouldable porcelain. No substance has ever been offered us to secure perfect adaptation to the root end in the cases mentioned, and the cement has been asked to do it for us. In this special place mouldable dental porcelain has absolutely no competitor.—*E. J. Perry, Chicago.*

Electric Ovens:—I have always maintained that so far as possible all the walls of an electric oven should be covered with heat producing wires. I do not believe that in these ovens we are consistent with the nature of things when an oven is made with an open front or one of the walls not a heat producing surface. This is not only essential for the even fusing of the porcelain, but for the life of the oven. The heat of an electric oven is obtained by radiation from every wire. Just in proportion as we cover all walls with wire and these wound as closely together as would be safe from buckling into lateral contact will the required heat of the individual wire be lower and the life of the oven be longer.—*L. E. Custer, Dayton, Ohio.*

Prosecuting Illegal Practitioners—In matters pertaining to our own State, the county and local societies can most efficiently aid the

State Board in enforcing our State law by securing competent testimony and other data when prosecution is determined upon. They can also secure the history of disreputable and illegal practitioners. It is also contemplated in our law that the local officials shall bring illegal practitioners into court. To get the officials to do their duty the local societies can and should be active in securing indictments when necessary, or otherwise see that the proper proceedings are taken to enforce the law. The State Board stands ready at all times to do their whole duty, and will advise and assist in local matters when possible.—*C. R. Taylor, Streator, Ill.*

Testing an Electric Furnace:—Every user of an electric furnace should provide for testing his muffle in case of failure to operate. This is easily done by taking a few feet of the ordinary electric light wire connected with a plug at one end and a small copper or brass point on each of the other ends. One of these wires should be cut and a lamp put in. The lamp will light up when points are brought into contact with the two terminal wires in the muffle if the wire is not burned out or broken. Some such arrangement will also prove to be a very great help in locating a break in case of repair. Where the wire has burned out there will usually appear a spot, but a break will not show and a tester is indispensable. In the majority of cases the burn will occur within three or four inches of the negative end of the wire, due to the excessive heating of the wire at that point.—*F. E. Roach, Chicago.*

Teach the Shopper to Appreciate Your Services:—I had the following experience with a shopper (whom it is not necessary to describe): A short time ago he brought his wife for examination and wanted to know the exact price. The price was stated and then he wanted to know how much it would cost to fill the most decayed tooth. This information was given, and the man then informed me that he had no money and would come in again. I told him to come and also told him what my fee was for the consultation just ended. He was exceedingly amazed and a second hurried consultation was held, this time between the man and woman with the result that they concluded to have the work done. The treatment was begun at once, half of the fee collected and the patient instructed to return for completion of the work. Two days later the patient kept her appointment and the work was completed and paid for in full. Moral: Charge for your examinations.—*J. P. Leonard, Joliet, Ill.*

Cement as an Aid in Starting Gold Fillings:—To any one who has not tried starting gold fillings with a little thin sticky oxyphosphate cement, I would say to him—begin. Prepare your cavities the same as for gold alone. Then place a quantity of thin cement the size of a pin head, more or less, with a small, short and slightly bent broach, in one of the anchorage angles, press a small pellet of unannealed gold lightly in place and continue with other similar pellets until you have a sufficient mass seated. Now mix a little more cement and treat the opposite anchorage point (be it in incisor, bicuspid or molar), in the same way, uniting the mass from the two points of anchorage. Proceed with your filling.

There is no need of smearing cement all over the cavity walls or upon the enamel margins. Use your instruments deftly. If any cement should go where it is not wanted—scrape it away.

By using cement in this manner you can practically make an inlay of your gold filling—for you can put a little cement at any part of the cavity you desire, both for its therapeutic and adhesive values.

Try a few prepared cavities in extracted teeth first, and you will find the technique is so simple that words are a mere superfluity in describing it. Brown colored cement has an advantage, for should any of it flow too near the marginal edge within the cavity, it can be seen and removed.—*T. W. Pritchett, Whitehall, Ill.*

Crowns:—Much is being said lately against crowns with bands for anterior teeth and many are arriving at the conclusion that bands are insanitary, but they never say anything against posterior gold crowns, which necessarily encircle the root at the gingival margin and pass underneath the free margin of the gum. If the band has been well fitted, we rarely find an unhealthy condition existing around a posterior gold crown, yet the principle is the same as that of a banded anterior root. Where we find the gums unhealthy around the anterior roots that have been banded the reason is found in the fact that the roots of those teeth are more difficult to fit than those of the posterior teeth, and the latter will tolerate a misfit better than the former. The fault does not lie with the bands, but with the imperfect fitting, and the careless preparation of the root.

I deem it unnecessary, however, to use bands when crowning single teeth. The bands will not prevent a root from splitting and a perfect joint may be made between the crown and root as follows: After the root has been prepared, and the crown ground to fit as well as possible, soften a piece of gutta-percha stopping, place over the end of crown with pin in position and press firmly to place on the root. When the stopping is hard, remove the crown and carefully trim the excess gutta percha even with the outside circumference of the crown. Plate gutta percha should not be used, as it drags. The crown is now cemented to place and it will be found that the cement will be a long time dissolving out. This makes a beautiful, natural-looking crown.

I will say concerning the crowns now on the market that most of them will give satisfaction, if discrimination against certain pins or pivots, is made in certain cases. Where there is to be much strain upon the pin, as where we find a long over-bite, the pure platinum pin should not be used.—*W. H. Reaben, McComb, Miss.*

OBITUARY.

CHARLES RICHARD TAYLOR, D. D. S.

DIED—At his residence in Streator, La Salle county, Ill., of typhoid fever, September 13, 1906, Dr. R. C. Taylor, in the fifty-eighth year of his age.

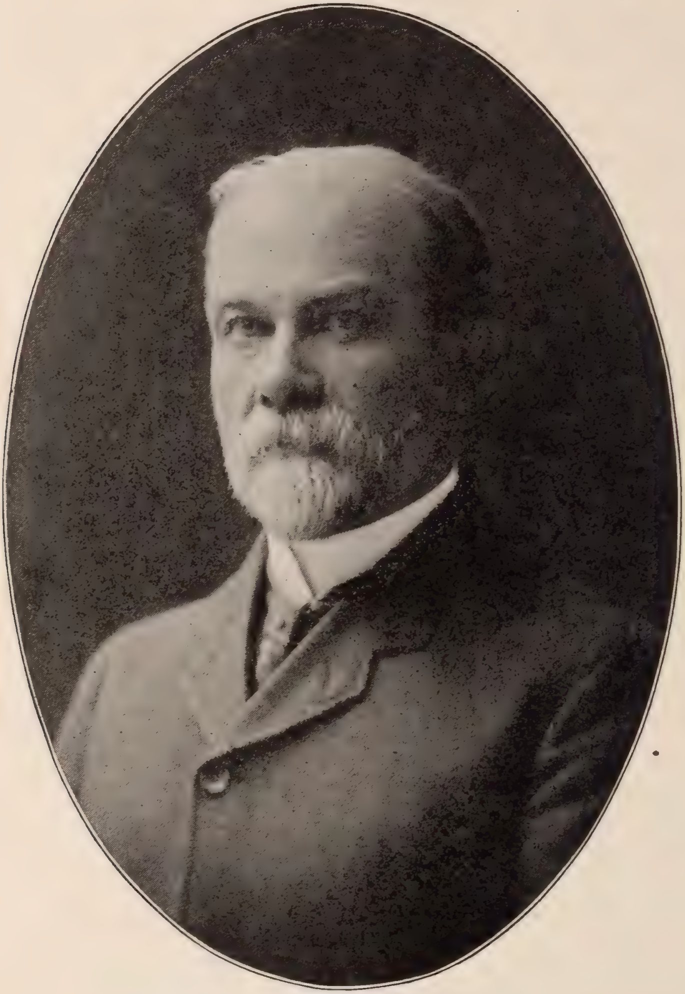
Dr. Taylor was born November 11, 1848, near Folkstone, East Kent, England. He came with his parents to the United States in 1852 and located at Derby, Conn. In 1858 they moved to Illinois. His earlier years were spent on a farm, he receiving a country school education. After various business experiences he took up the study of dentistry and was graduated from the Philadelphia Dental College in 1876, he being president of his class. In 1877 he located in Streator where he was in continuous practice until the time of his death.

In 1879 Dr. Taylor married Miss Jennie Phelps, of Sandwicn, Ill. Mrs. Taylor and one daughter, Vera, survive him.

At the time of his death Dr. Taylor was a member of the Illinois State Board of Dental Examiners, a life member of the Illinois State Dental Society, the La Salle County Dental Society and the Streator "Fellowship Club," a society organized by himself to promote good fellowship among his brother practitioners. This society was the means of cementing the men together into an ambition for the high ideal for which Dr. Taylor's life stood. He was also instrumental in organizing Fellowship Clubs in many towns in Illinois and other states.

Dr. Taylor was a Royal Arch Mason, a member of the Delta Sigma Delta

Fraternity, Modern Woodmen of America, Streator Club and the Church of Good Will. He was a man of highest mental and moral attainments and his life was spent in seeking the Truth and striving to attain the Ideal, not for his own benefit but for the uplift of his fellow creatures.



Dr. Charles R. Taylor.

His domestic life was beautiful. By Dr. Taylor's death the profession has lost an able and respected exponent and his community has suffered an irreparable loss.

VICTOR H. FUQUA.

LETTER FRON DR. PRITCHETT.

WHITE HALL, ILL., September 17, 1906.

DEAR DR. JOHNSON:

Returned but yesterday from Streator, where the funeral obsequies of our beloved Dr. Charles R. Taylor were observed—I would feel remiss in not recording some thoughts as a result of that sad journey.

The tidings of his demise came as a convulsive shock, even to those near to him, because of its unexpectedness. Dr. Taylor was a grand, good man! Words, tokens and everything that could betoken the esteem and appreciation in which he was held, by relatives, citizens, and local professional contemporaries, were abounding. The beautiful home life; his active, intelligent and perservering efforts to upbuild his home city, in its commercial, educational, esthetic and moral aspects; his kindly, cheering and encouraging ways in daily contact with those about him, pointing constantly to higher ideals and practices of life; his perfect integrity of character under all conditions and circumstances—together with many other beautiful attributes couched in simple language, was heard on every hand, showing its sincerity—"We all loved Dr. Taylor"; "We were so fond of him"; "No one to fill the place of Dr. Taylor."

I was received in his home, was shown his office, alas! the master was not there to bid me welcome. The beauty of the good, helpful and exemplary life led by Dr. Taylor, our dear friend and co-worker, attracting to himself the warm friendship, love, respect, honor and admiration—influencing in some degree the life of those about him, as expressed by one speaker who knew him thoroughly—"was the utter absence of his own consciousness of it. It was his nature, innate, spontaneous—and mankind made the better by such a life having been lived."

Some of us more remote from frequent contact with him, have had glimpses of the strength and quality of this splendid man in everyday life, but were not aware of the fulness and perfection of it until manifested, the day before yesterday, by the words spoken, the tokens presented by those within the circle of that daily life. They will miss him, they will miss him—and so will we.

T. W. PRITCHETT.

DR. WILLIAM KAY.

Dr. William Kay died, aged 34, of acute dysentery at his residence, Philadelphia, Pa., on Monday, July 23, 1906, after a week's illness.

Dr. Kay was born and received his early education in Dumfries, Scotland, and was also six years in the office of the late Dr. Wood of Dumfries.

He came to this country in 1892. In 1893 he entered and in 1896 graduated from the Philadelphia Dental College. Since then he practiced in Philadelphia.

In 1899 he became demonstrator of operative dentistry and in 1904 demonstrator of crown and bridge work in the Philadelphia Dental College.

He was a member of several dental societies and sometimes gave clinics at their meetings.

He was buried on Thursday, July 26, at Woodland cemetery, Philadelphia.

The doctor leaves a widow, three small children and a large circle of friends to mourn his early demise.

T. J. MC.

DOMESTIC CORRESPONDENCE.

A CORRECTION.

To the Editor of The Dental Review:

Dear Doctor—Under the head of Memoranda, page 961, September issue of The Dental Review, appears the statement that "the St. Louis Dental Society, the oldest continuous dental organization in the world," etc. This statement is entirely erroneous, as the St. Louis Dental Society was organized December 16, 1856, while eleven years previous to that date, December 15, 1845, the Pennsylvania Association of Dental Surgeons was organized in Philadelphia and has been in *continuous existence* ever since, thus making it the oldest dental society in the world, and entitled alone to this distinction.

Very truly, Burton Lee Thorpe.

St. Louis, September 4, 1906.

To the Editor of The Dental Review:

Dear Doctor—In that part of my paper relating to the tin-and-gold strips, page 762 of The Dental Review for August, I am guilty of a grave oversight in forgetting to state and emphasize the necessity of so folding the strips in the cavity that alternating strips of metal may stand as nearly as possible parallel to the line of stress.

Very truly, J. R. Callahan.

MEMORANDA.

MICHIGAN BOARD OF EXAMINERS.

The next regular meeting of the Michigan Board of Examiners for the examination of applicants will be held at the Detroit College of Medicine, Detroit, October 24-27, 1906. A. L. LeGro, *Secretary.*

THE NORTHERN ILLINOIS DENTAL SOCIETY.

The nineteenth annual meeting of the Northern Illinois Dental Society will be held at Aurora October 17 and 18. Dentists of that district will please mark off the above dates from their appointment books. "Do it now," and don't fail to attend. An excellent program and good attendance is always confidently expected. A. M. Harrison, *Secretary.*

Rockford, Ill.

OHIO STATE BOARD OF DENTAL EXAMINERS.

The regular semi-annual meeting of the board of dental examiners of the state of Ohio will be held in Columbus, commencing November 27, 1906.

Only graduates are eligible to examination.

Application, accompanied by fee ($20) should be filed with the secretary by November 17th. For further information, address H. C. Brown, secretary, 185 East State street, Columbus, Ohio.

SOUTHERN ILLINOIS DENTAL SOCIETY.

The annual meeting of the Southern Illinois Dental Societv will be held in Centralia October 23 and 24, 1906. The chairman of the executive committee assures us an excellent program and that a number of essays and clinics, both interesting and profitable, are to be reserved for this occasion. An interesting feature of the meeting will be a banquet.

A most cordial invitation is extended to all ethical members of the dental profession. HARRY K. BARNETT, *Secretary.*

IOWA STATE BOARD OF DENTAL EXAMINERS.

The Iowa State Board of Dental Examiners will hold its next meeting at Iowa City, beginning at 9 a. m., Tuesday, December 4, 1906.

Written examination in all the regular college branches, also practical work in operative dentistry. Engines will be furnished but instruments and materials must be supplied by the applicant.

Applications must be in hands of secretary at least five days prior to above date. For application blanks and further information address E. D. Brower, secretary, Le Mars, Iowa.

A DEATH FROM SOMNOFORM.

Additional interest is given the paper of Dr. Ritter appearing in this issue in the recent death of a patient in Rockford, Ill., following the administration of somnoform. The patient was a married woman about twenty-eight years of age, and apparently in perfect health. The agent was administered the second time at an interval of half an hour to remove a fragment of root left in at the first administration. The patient never recovered consciousness after the second administration and died within fifteen minutes despite all efforts to save her. The coroner's jury exonerated the dentist from blame.

NEW JERSEY STATE BOARD OF REGISTRATION AND EXAMINATION.

The New Jersey State Board of Registration and Examination in Dentistry will hold their semi-annual meeting in the state house at Trenton, N. J., beginning Monday, December 10th, at 9 a. m. promptly.

Practical and theoretical work will be completed in the same place.

Examination extending from the 10th, 11th, 12th and 13th.

For information apply to the secretary, Charles A. Meeker, D. D. S., 29 Fulton street, Newark, N. J.

All applications must be in the hands of the secretary ten days prior to the meeting. CHARLES A. MEEKER, *Secretary.*

HARVARD DENTAL ALUMNI ASSOCIATION.

The following named officers were elected for the ensuing year at the thirty-fifth annual meeting of the Harvard Dental Alumni Association in Boston, Mass., June 25, 1906:

President—Arthur W. Eldred, '90, Worcester, Mass.
Vice-President—Harvey W. Hardy, '96, Boston, Mass.
Secretary—Waldo E. Boardman, '86, Boston, Mass.
Treasurer—Harold DeW. Cross, '96, Nashua, N. H.

Executive Committee—Waldo E. Boardman, '86, Boston, Mass.; Arthur A. Libby, '99, (one year), Boston, Mass.; William W. Marvel, '00, (two years), Fall River, Mass.

WALDO E. BOARDMAN, '86, *Secretary.*

ANNOUNCEMENT.

The members and friends of the G. V. Black Dental Club of St. Paul (Inc.) will hold their annual midwinter clinic in February, 1907.

Last year we held the largest, best and most enthusiastic meeting ever held in the Northwest, between 400 and 500 practitioners being in attendance. This year we wish to have an attendance of 1,000.

The program is now being arranged by the clinic committee. The operative clinic will be on its usual high order. There will be a number of progressive clinics on both days of the meeting. Several of the best known men in the dental profession will read essays.

The table clinics will be the most interesting and instructive which we are able to obtain. The program and dates on which the meeting will be held will shortly be published.

As this is the only midwinter clinic held in this section of the country, I take greatest pleasure in extending a most cordial invitation to the members of the dental profession in the United States and Canada to attend our clinic.

Special rates on all railroads.

For any further information apply to R. B. WILSON, *Secretary,*
107 East Sixth street, St. Paul, Minn.

ILLINOIS STATE BOARD OF DENTAL EXAMINERS.

The regular annual meeting of the Illinois State Board of Dental Examiners for the examination of applicants for a license to practice dentistry in the State of Illinois will be held in Chicago at the Chicago College of Dental Surgery, corner Wood and Harrison streets, commencing Monday, November 12th.

Persons in possession of the following requirements will be eligible to take the examination: First, all persons who have been engaged in the actual, legal and lawful practice of dentistry or dental surgery in some other state or country for five consecutive years just prior to application; second, or is a graduate of and has a diploma from the faculty of a reputable dental college, school or dental department of a reputable university; third, or is a graduate of and has a diploma from the faculty of a reputable medical college or medical department of a reputable university, and possesses the necessary qualifications prescribed by the board.

Candidates will be furnished with proper blanks and such other information as is necessary upon application to the secretary. All applications must be filed with the secretary five days prior to the date of examination, and the diploma must be presented at the time of matriculation.

Address all communications to

J. G. REID, D. D. S., *Secretary,*
1204 Trude Bldg., Chicago,, Ill.

THE

DENTAL REVIEW.

VOL. XX. CHICAGO, NOVEMBER, 1906. NO. 10

STERILIZATION AND DISINFECTION AS RELATED TO WATER, INSTRUMENTS AND SOFT TISSUES, INCLUDING PUTRESCENT PULPS.*

BY A. W. HARLAN, M. D., D. D. S., NEW YORK, N. Y.

Water should be free from contaminations prejudicial to health. It is not a necessity that water should be distilled in order to drink it, or use it as a solvent for disinfectants. It should be odorless and free from taste, and show absence of acids, chlorides, and sulphates. If the organic matter, including solids, reaches much above 15 or 16 parts per thousand it usually needs to be precipitated and filtered. This is accomplished in various ways. Formerly alum was used (and is now) for precipitating certain albuminoid elements of water. Recently, however, much attention has been given to the use of copper sulphate, and colloidal copper for purifying water for drinking purposes and for sterilizing it so as to render it free from noxious bacilli and bacteria. The question of pollution of water from sewage and outhouses, barns, drains and like sources of contamination is one that need not concern us tonight. Any supposed potable water may contain large numbers of bacteria, that are harmless, but if there are two or three to every litre of water, that are pathogenic, then we need precipitation and sterilization.

HOW IT IS ACCOMPLISHED.

If you will take a copper boiler or pot and have the interior thoroughly polished and leave the water standing in contact with this surface for three and one-half hours the various substances floating and dissolved in the water will be precipitated, in consequence of the solution of a small portion of the polished copper surface. This will not affect the taste, but the water will be sterilized. If the water is then filtered it is ready for use. It is not necessary to boil it to drive off the gases, as that will make it taste insipid. Water which does not hold gases in suspension is usually tasteless. We prefer water which is pleasant to the taste and for all growing children a pure water is a necessity; distilled water, even if aereated lacks as a constituent the inorganic salts which are so necessary for growth of bones, teeth, cartilages, nails and hair. When we want to sterilize water quickly we take a copper coil, place it in a jar or pitcher of water and turn on the electric current and in ten minutes we will have copper sterilized (boiled) water for use at the chair or elsewhere.

---

* Read before the Odontological Society of Chicago, March 13, 1906.

STERILIZATION OF INSTRUMENTS.

This is a certain method and not injurious to your hands or the instruments. Many methods of sterilizing instruments are in use just as there are many ways of disinfecting the hands. A pint of copper sterilized water is placed in a glass dish, add five grains of dried sodium carbonate and immerse the instruments (which have been scrubbed with a sterilized brush in sterilized water) for five minutes, and then rinse them with copper sterilized water in a second dish, and dry them with cotton cloths that have been heated to 350° F. and place in a covered glass dish and they are ready for use.

The paper or cloth covers for the operating table may be sterilized with dry electric heat in a suitable sterilizer operated with a small electric cooking oven. It is understood that the office girl will scrub her hands in liquid soap or green soap and rinse them in diluted alcohol before rinsing the instruments. This will require only a stock solution of one ounce to the pint of copper sterilized water. All of the solutions used around the chair can be made with sterilized water. In all cases it should be filtered through clay or some other approved substance to remove the precipitate. It has been found that one part of colloidal copper will sterilize 8,000,000 parts of water, so there should be no need of the fear of being poisoned with dissolved copper.

All of the soft portions of the mouth, gums, tongue, lips, cheeks, palate, may be disinfected by using a carbonated copper water to which is added ½ gr. to the ounce of dried sodium carbonate, large pellets of cotton wool, previously sterilized, are used to swab the mouth; these are carried with large, flat, wide pliers made of copper, polished after using, so as to be ready for the next case.

I will now add a few words to an elucidation of a system of:

DISINFECTION AS RELATED TO DECOMPOSITION IN AND AROUND THE ROOTS OF THE TEETH.

Before reading the whole paper I wish to take you into my confidence thus far: We are told that we can disinfect with sodium dioxide with kalium-natrium (potassium and sodium) with 1 to 500 or 1000 of bichlorid, with cresol with iodin and sodium iodid and water, with formol—with formalin and cresol to say naught of many other substances. Why there are persons who think even now that they can disinfect with zinc chlorid when it has been known that any pus producing spore will live in a saturated solution and come to life just as soon as he is planted in a suitable medium for growth. Do you wonder then that we are only beginning in our knowledge of root disinfection, of infected and poisonous substances from decomposition of animal tissues? Much confusion exists on this subject in the minds of those who get all their information from supposed chemical reactions taking place within a pulp chamber during the process of decomposition of the pulp. When we consider that cadaverin has the formula of $C_5H_{14}\ N_2$, and neuridin has $C_5\ H_{14}\ N_3$, and putrescin $NH_2\ CH_2\ (CH_2)_2$, $CH_2\ NH_2$, $C_4\ H_{12}\ N_2$, and acetic acid $CH_3\ COOH$, to say nothing of indole, cresol, skatole and other substances too numerous to mention, is it wonderful that mistakes are made? All of these substances and even others, including phenol itself are to be found in the decomposed pulp and they are to be reckoned with as the final end products of decomposition of the pulp. Pin not your faith to any universal destroyer of mephitic gases and odors, and the poisonous by-products of these numerous decompositions and redecompositions.

If you can first cleanse the solid alkaline and amino-acid products of decay from the pulp chamber and then attack bacteria and their spores you are more certain of complete disinfection than to depend upon a gas destroyer alone to modify them. With these brief remarks I will present to you in a condensed form my own observations. The complex and elusive substances which we are to combat, in some cases are transitory. They vary in quality, so that we are unable to fully estimate the virulence of the infection. This will explain why there may be failure at times to disinfect. Hence, we are compelled to overwhelm not only the organisms and spores, but the multifarious end products of decomposition. Many of these are soluble in water, so that is the hint for the first step in disinfection.

Disinfection necessarily implies infection. For our purpose tonight we will confine our remarks to a consideration of the effects of decomposition within the root of a tooth or around it. The effect of the retention of decaying and decomposed pulp tissue on the dentine and cementum of the tooth is to poison them, and if any of the products of decomposition pass through the end of the root, there is irritation, inflammation, and usually suppuration. This is what we wish to avoid.

I need not describe how or why a pulp dies; we find it dead when there is decomposition in the root. (Very rarely is any portion of the pulp alive when there is decomposition in the root.) In this decomposition we have H_2S and NH_3, two gases which will produce pressure and give pain to the surrounding tissues, including the whole organism, unless there is an outlet provided for them. You are all familiar with the pain produced by a forming abscess, which is usually presented to you at an inopportune time. To convert ammonia and hydrogen sulphid into a solid or liquid is said to be the surest and most certain method of disinfection. The alkaloids, putrescin, cadaverin and neuridin being solids are not acted upon directly by drugs except to withdraw the nitrogen. These alkaloids are soluble in water, so that care should be exercised to not use peroxide of hydrogen or liquids to force them through the apex.

Many methods have been proposed to render gases inert. Buckley uses formaldehyde and cresol. I have found that a crystal of mono-chloro-acetic acid will do this. In all cases of putrescence within a pulp chamber or root canal, by first isolating the tooth and washing its interior carefully with copper sterilized water, then partially drying it, I place a crystal block of the acid in the center of the pulp chamber, and if there is not sufficient moisture a drop of sterilized water is added. Within five minutes the tooth may be sealed hermetically with cement.

I prefer a quick setting cement, mixed soft. Ames' special inlay cement is good, or Justi's No. 2. Leave this tooth alone for a few days and open it under antiseptic precautions. This means to not allow saliva or hydrant water or an unsterilized broach or instrument, to enter the root canal or go through it to push any foreign matter into innocent tissues.* In this process if the tooth were discolored it is bleached at the same time that the disinfection is being accomplished. By this method we only generate a gas to break it up and make oxidizing agents of the gases of decomposition and the numerous animal alkaloids present within the tooth.

For more than seventy years we have been groping for some drug that would control and minimize gaseous production during the putrefaction of pulp tissue. This will do it and at the same time hold the color of the tooth. You do not need to be changing the dressing every day or two, for it is not needed. The worst case of putrescence will yield after two treatments at intervals of one week. If there is a blind abscess at the apex of the root, it must be drained and washed with sterilized water and a crystal of the acid introduced and sealed into the cavity to remain for a week or even longer. After these dressings are removed and the roots are washed with sterilized water and dried, they are to be filled to the apex if possible. (You may use this acid in 10 per cent solution to inject through the root and the fistulous tract leading to the surface of the gum.)

DISINFECTION AROUND THE ROOTS OF TEETH.

In all cases of suppuration of the sockets (not mercurial or syphilitic) it is necessary to disinfect the mouth first of all. Second, to remove all deposits from the roots of teeth, including the perceptible edges of necrosed bone. The sockets are to be deluged with cleansers first, and then every pocket (where there is a pocket) is to be burned with some destroyer of tissue—lactic acid, trichloracetic or monochloro-acetic acid. I prefer the latter, as it will destroy that sickening odor that we find exhaled from the mouths of pyorrhoea patients. After teeth are treated in this manner they should be left alone. It is suggested and urged and commanded that teeth should be lashed together or bolted with staples or banded or held with bridges or fixtures so that reparative processes will not be interfered with. After all is it not logical to insist on the mouth being kept clean, and the patient's system flushed with water to wash out the auto-intoxicants and give the tissues an opportunity at the ends of the arterioles to build new supports for loose teeth? If you destroy the local causes of decomposition and obliterate the pockets, even though you lose some useless gum tissue, the patient is the gainer and he saves his teeth for daily use, and is free from suffering every time he tries to masticate solid food.

---

*I am not ready to publish the supposed reactions, as they are not finished.

SIXTY-TWO YEARS OF DENTISTRY.*

BY DR. L. P. HASKELL, CHICAGO.

Mr. President and Members of the Chicago-Odontographic Society:

Words fail me to express my appreciation of the honor you have bestowed upon me this evening. When it was whispered to me that such an event was to transpire, I said: "Who am I that such an honor should come to me?" I thought it must be a mistake. When it was finally announced, I said to myself it was not on account of any great achievement that had led to it, but because the good Lord had given me length of days, such as come to few dentists, and also the sixty-two years of practice so few have reached.

My length of days is owing primarily to a good constitution and good habits, and, perhaps, because I have not "sown wild oats." It is said a man is no older than he feels, and I feel no older than when fifty years of age. I can accomplish as much as ever; in fact, the only thing that reminds me of age is that all my old confreres have passed away.

I realize the more the extent of the honor you have here bestowed upon me when I consider that this society has the largest membership of any dental society in the world, excepting our state society, and embracing in its membership such a galaxy of prominent men, a few of whom I will mention.

Here is our Dr. Black, the most noted and successful investigator along various lines. Our Dr. C. N. Johnson, who combines in himself a noted operator, demonstrator, teacher, lecturer, writer, editor and poet, and where is his equal? Our Dr. Brophy, who has achieved a world-wide reputation as an oral surgeon, and along lines once declared impossible. Our Dr. Case, who is unsurpassed in orthodontia. Dr. Cook and Dr. Hinkins, specialists in the chemistry of the mouth. The Noyes, father and son; the latter especially distinguished in histology. Our Dr. Talbot, noted for his investigations in the etiology of the irregularities of the teeth and hereditary taints. Our Dr. Good, the apt scholar of Dr. Younger, and successful specialist in the treatment of pyorrhea. Our Dr. Taggart, one of the discoverers of the application of electricity in the baking of porcelain. Our Dr. Roach, who has invented the automatic electric oven. Our Dr. Goslee, the most prolific writer on crown and bridge work as well as successful demonstrator. Our Dr. Cigrand, the dental historian, technic instructor and writer. Our Dr. Bentley, unsurpassed as an organizer, who, I believe, originated this society, was its first president, and organized the greatest dental clinic ever held, attended by 2,500 to 3,000 dentists. I have mentioned but a few of the able men of this society and I doubt if there is as large a number of first-class operators in any other dental society, and these are largely men in the prime of life. It is to such a society I am indebted for this great honor.

---

* Read at the banquet tendered to Dr. Haskell by the Chicago-Odontographic Society, May 15, 1906.

As to my long service there are four reasons for its continuance. First, necessity. I have realized that acknowledged ability, long experience, wide reputation, honest dealings, close application do not always insure financial success. There are other factors involved. The second reason is that to retire and live a life of idleness would be to me misery. The third reason is my love of the work, and the fourth is that as an instructor I am benefiting others, and finally, I can not say as the Irishman, when asked what he would do if he was rich, replied: "Be jabers, I would go to the foinest hotel, and take the foinest room, and tell them to call me at six o'clock in the marnin'." "What would you want to be called so early for?" "Sure, and they would come and knock and knock, and I would tell them to the devil with ye, Oi do not have to get up at six o'clock."

A short résumé of my professional life, giving, as it does, incidentally something of the history of dentistry for more than sixty years, may be of interest.

Eighty years ago the 25th of April a boy was born in the city of Bangor, Maine, as the legend usually runs, of "poor but honest parents." The next day the father informed his neighbors that a missionary was born in his house. The father died five years later.

What the boy's career would have been had he lived to see the boy grown to manhood we may imagine from what the father told his neighbors. However it may be he has been doing some missionary work in his chosen profession. The mother married again and moved to Massachusetts when the boy was eleven. He attended school until fifteen, then went to Boston and entered a printing office as an apprentice, where he remained four years, at which time a brother-in-law, a dentist, wished him to study dentistry, and he at once commenced preparation for his future career. The dental student of today little realizes the great advantage he has over the student of fifty years ago. There was a dental college, the Baltimore, a few years old, but dentists claimed that a student could be better prepared for practice in the office of a good dentist than in the dental college, and I apprehend it was true in the early days of the college. There were no dental associations; no journals; text-books were few and crude; dental offices were close corporations, for unless you were intimately acquainted you were not allowed access to the operating room or laboratory of another dentist. Every dentist had his secrets.

There were no dental depots; but small stocks of goods were kept by druggists. The dentist had to prepare his own gold plate and solder or go to some manufacturing jeweler. So, among other things, I had to learn how to melt and refine gold and make gold solder.

The first dental depot in Boston was opened by Jones, White & McCurdy, of Philadelphia, the predecessors of the S. S. White Company. Previous to this, the teeth in use were made by Alcock, and later Stockton, the uncle and instructor of S. S. White. The variety and supply were small. White's teeth were a great improvement on previous makes; in fact, there were some shades superior to the present makes. For a time after I went into business for myself, with a partner, we filled orders for gold solder, all 18K, for the dental depot.

All artificial work was on plates, gold and silver, from one tooth to a full set, and of course was all soldered work. Full sets were made on narrow plates, and spiral springs, curved backward in the cheek, held them in place. My preceptor made the first suction plate in that region. The impression was in beeswax, the die of tin. The case was for an old man. The adhesion was so great, a test was made by soldering a hook to the center of the plate, to which was attached a long wire, and on this was suspended a common water pail, filled with water; and the patient raised it by the plate. Soon after this plaster was used for impressions, the common plaster of commerce. The plates were fitted close to the palate.

Later, the vacuum cavity, called the Gilbert, came into general use, and some years later the "Cleveland" vacuum cavity was introduced, but long since discarded.

In those days some dentists were making their own teeth, carved blocks. My preceptor engaged a carver from Philadelphia, and soon after I began to take instruction from him. My first duty was the preparation of material, taking the crude Quartz and Feldspar, calcining, breaking in small pieces and grinding in a large mortar. These materials were mixed in proper proportions, coloring matters added and made into a sort of putty. A carving model, including the gold plate, was made. The material pressed in, partially dried and the teeth carved in three sections; then placed in the furnace and biscuited, trimmed, holes drilled, the pins inserted, teeth and gums enameled and baked in a large brick furnace lined with fire-brick. The muffles were fourteen inches long and four wide. The fuel was the best Lehigh coal. The fusing point was greater than that of teeth we now use. We made our gum color, the coloring being the oxide of gold and tin. This line of work I practiced for eleven years.

It was about fifty-five years ago that I introduced Babbitt metal into the laboratory, and it remains today the only metal containing the five requisites for a dental die.

The soldering was done for many years with an alcohol lamp and mouth blow-pipe. I learned to operate and put in gold fillings; one large one I saw eleven years later. I however determined to confine myself to what was then called mechanical dentistry.

In 1851 John Allen's agent came to Boston to sell licenses for continuous gum work. We paid $150 for it, and I have continued to use it ever since. Strange as it may seem, after fifty-five years' use, it remains the only ideal denture for strength, natural appearance and cleanliness. I have just replaced a set worn for forty-five years.

In 1856 I removed with my brother-in-law to Milwaukee, where I remained one year, then came to Chicago and was associated with

Dr. Allport for eleven years. When I first saw Dr. Allport he was located in a two-story and basement brick dwelling house on Clark street opposite the court house. The street was planked; an omnibus running to the North Side had the starting place in front of the office. He had a kitchen and dining room in the basement, and provided for many table boarders to help pay bills. In the spring of 1857 he moved to the corner of the alley on Washington, between State and Wabash, in a three-story brick dwelling. His friends remonstrated with him for going *so far out of town.* Dr. Allport was one of the most noted operators of his time; he was always my beau ideal, and it seemed as if he were made to order for an operator.

In the spring of 1859 I visited Boston, and calling upon an old friend, Dr. J. A. Cummings, he took me into his private office and showed me his first specimen of teeth on vulcanite, saying he was part owner of the patent. It was soon after placed on the market and a year later we purchased a license; the first set we sent to New York to be vulcanized. Later we purchased a vulcanizer. It was of cast iron, about eighteen inches in length and ten in diameter. It was heated over a small cylinder coal stove.

Within two years I noticed an unusual change in the alveola, owing to the retention of undue heat, and it has ever since shown this objectionable feature.

Some years later a material, called rose pearl, was produced for plates, followed by pyroxolene, and still later by celluloid, all products of camphor and gun-cotton.

A Chicago dentist produced a sensation by publishing in the daily papers articles upon what he called "Patented Combination" sets of teeth, continuous gum work covering the alveola and attached to a rubber plate. It was short lived, however. About fifteen years later a Detroit dentist brought out the same thing as a new invention, and some years later an Ohio dentist rediscovered the method. This recalls to mind that recently a dentist in this city was demonstrating "a new and improved method of constructing a continuous gum denture," which was precisely a method I had discarded fifty years ago as crude and unartistic.

The first dental depot in Chicago was opened by the S. S. White Company on Randolph street, just west of Dearborn, in charge of Mr. Bingham.

The Chicago Dental Society was organized at this dental depot in the year 1864. Dr. E. A. Bogue, now of New York, and myself are the only surviving charter members. All of the dentists but two besides myself then in practice here have long since died.

Owing to the introductions of crown and bridge work it became necessary for dentists to learn these methods, and in connection with it, instruction in metal plate-work. As so few were doing such work in 1889 I established the first post-graduate dental school and in connection with it the first dental laboratory for doing the work for other dentists. Students entered from every state in the union, Canada, Mexico, Chili, Honolulu, Australia, New Zealand, nearly all European nations and India. I continued it for ten years and then gave it up. Three years ago Dr. Keefe wished me to connect myself with his school, so am in the harness again.

In 1898, 1899 and 1900 I went to Europe, accompanied by a partner who instructed in crown and bridge-work, and we taught classes in Berlin, Hamburg, Vienna and Paris. The instruction was given in dental depots, except Paris at the Ecole Dentaire. Each student did the work himself, the only practical method of instruction. My reception by the dentists of those cities was very cordial. I had been in Berlin but one week when invited to address the oldest dental society, which I did through an interpreter. The next week another society extended an invitation, to which I responded. The Hamburg Dental Society also requested me to give them a talk, and the next day sent me 100 marks as a slight remuneration for my time and trouble. At Vienna the Austrian Dental Society entertained me at a banquet. In Paris the Odontological Society invited me to address them, and the American Dental Club entertained me at the Davenport Brothers' office. At these classes we had dentists from nearly all European nationalities. The instruction was given through interpreters, who were dentists who had spent several years in America and so were familiar with the English language. The classes were a decided success.

For more than forty years I have been writing for the dental journals at the solicitation of the publishers or editors. I have been encouraged to do this by the remarks made by dentists whom I have met, entire strangers to me, saying they always read all they saw from my pen.

In 1863 I commenced the publication of the *People's Dental Journal,* edited by Dr. Allport, with an excellent corps of contributors. The object was to furnish dentists, at small cost, educational matter for their patients. It was a quarterly and eight numbers were issued. I expect I have the only bound volume in existence, which some day I will place in some college library.

Several years ago I published two editions of a small work, the Students' Manual and Text-book for the Dental Laboratory.

When the Chicago College of Dental Surgery was organized I became a member of the faculty and continued for four years, and afterward for three years was a member of the faculty of the Northwestern. I became convinced that mechanics could not be taught in the lecture room, but only at the bench, and as prosthetic dentistry is mainly mechanical, the laboratory is the place to teach it.

Do we realize in what an age of development we live? I venture to assert there is no profession has made such great and rapid development as ours, especially during the past twenty years, and mainly in the prosthetic department.

Again I thank you for this great honor you have seen fit to bestow upon your humble servant and hope to continue to retain the esteem and respect of you all, proving that the old saying, "a prophet is not without honor except in his own country," in this case is not true.

THE LARGER VISION.*

BY C. N. JOHNSON, M. A., L. D. S., D. D. S., CHICAGO, ILLINOIS.

If there is any supreme intelligence behind the fact of man's existence in the world, the purpose of placing him here must have been that he should do good and be happy. It is inconceivable that any other purpose entered into the plan of his destiny. If this be true, then it is well for thinking men to consider somewhat carefully why it is that men are not all good and all happy.

Without attempting the solution of so great a problem as this in all its bearings, I venture to suggest that one of the reasons why man falls short of attaining his highest destiny is because he takes too narrow a view of things and allows minor matters to enter too prominently into the affairs of his life. The small distractions of everyday experience are too frequently permitted by his point of view to assume a wholly unwarranted magnitude and to materially warp his trend of thought and seriously affect his happiness. It is with this in mind that I have ventured this evening to invite your attention to a larger vision of life and its possibilities, and to consider in brief some of the factors which make for or against man's highest attainment.

---

*Read at the banquet tendered to Dr. L. P. Haskell by the Chicago Odontographic Society, May 15, 1906.

While it may be true that the sum-total of the average individual's experience is made up for the most part of small happenings, and while we cannot wholly ignore the little things as possible factors in determining one's destiny, yet the truth remains that much of the unhappiness in the world is fostered by an altogether unwarranted magnification of the things which in the ultimate have really little significance.

If some person says an unkind thing about us we are too much inclined to allow it seriously to interfere with our happiness. We may be deeply hurt and grieve over what we consider an injustice done to us, or we may kindle with resentment and expend our energy in anger—either of which needlessly detracts from our peace of mind. If we could only stop to reason that a slighting remark made by another really does no one harm except the one who makes it, that injustice of any kind reacts mostly on its author, and that the small and petty criticisms of thoughtless or even malicious individuals never affect in the slightest degree the substantial welfare of others, we would not allow ourselves to be made unhappy through this medium.

It is something of a revelation to study in the light of subsequent experience the history of most of the passing events which at the moment seem important and which disturb our equanimity. It will be found in the main that as time recedes they melt away into positive insignificance, which means that they were of no real import as affecting permanently the current of our lives. The only degree to which most of these things can bring us injury is as we permit them an entrance into our thoughts as disturbing factors. Just so soon as we learn to view broadly every question which confronts us, to look over and beyond the present and gauge it by its ultimate effect, just so soon shall we disarm our consciousness of many of the petty annoyances which bombard us in our everyday experience.

Above all things, if we are to get the most out of life and enter securely into the larger vision we must assume an absolute mastery over resentment against our fellowmen. If an individual does us a wrong, there are several ways of meeting the issue. The one most commonly in vogue is to resent it and to proceed at once to what in ordinary parlance is termed "getting even." There never was a more fatal error. Every bit of energy used in such an effort is worse than wasted. It may or may not bring injury to the object of the resentment, but it invariably does to the author of it. No man can attempt to do another harm, whether in retaliation or otherwise, without seriously injuring himself. And I have always been doubtful about the quality of satisfaction ostensibly enjoyed by the man who triumphs over another in a contest of retaliation. To see an individual suffer through the agency of our own effort, to see him humiliated and humbled into the dust, even as a punishment for a real wrong, is not an inspiring spectacle. The better way to meet a wrong is either to ignore it, which is often wisest, or else to reckon with it merely to correct it and prevent its repetition. The reason it is usually wise to ignore a wrong is because most of the so-called wrongs we suffer are really of little significance as affecting our welfare unless—as has just been said of the petty annoyances of life—we give them entrance into our consciousness and brood over them. This is especially true of all that numerous troop of wrongs emanating from the category of the minor vices, such as gossip, deceit and envy. If a slighting remark is made about us the first thing to do is to closely examine ourselves and see if the remark may not be true. Our critics can sometimes see a fault in us that we are unconscious of, and they are frequently of real benefit to us in calling our attention to it. But if their criticism is manifestly unfounded and is simply due to a mischief-making spirit, then the surest way to disarm them is to ignore it.

If a real wrong is done us which must be reckoned with, the proper spirit in which to meet the issue is in the line of correction rather than of vengeance. We should right a real wrong under all circumstances, but we should make sure that our motive is above reproach and our actions in accordance therewith. Our sole aim should be to prevent a repetition of the wrong and thereby improve the condition of society—not so much to punish as to control. Our whole system of legal procedure in the courts of our commonwealth is wrong. Even if fundamentally based on justice, as they are supposed to be, the practical management of cases in our courts goes so far and wide of the mark as to be merely a travesty on justice, honor and the rights of man. The ostensible aim of a trial in court is to arrive at the truth, while as a matter of fact the real aim of the contending parties is to hide truth and create prejudice. Nothing is left undone, no matter how small, trivial or unimportant, to bring about a distortion of facts. The aim is not to redress a wrong, but to win a case, and in the unholy endeavor to accomplish this, irrespective of the merits of the contention, all of the viler instincts of humanity are abundantly played upon till honor is trampled in the dust and the beautiful goddess of justice is trailed through the mire of perfidy and disgrace. It is rapidly becoming recognized that so far as correcting wrongs is concerned our courts are a dismal failure, and all this is because of the fact that in legal procedures as in most other affairs of life the larger vision of equity and justice is buried in the maze of petty personal ambition and prejudicial strife.

In the floatsam and jetsam of the tide of human life, it seems inevitable that much that is rubbish is cast upon the shore, and this rubbish has to be reckoned with. Some of it is harmful to the body politic and must needs be controlled by law. But in seeking to control we should have a care that we do not further degrade the baser impulses of humanity by carrying to persecution what should only be correction.

We are all far from perfect and we cannot believe alike. This should teach us the sublime lesson of patience and of charity. We should seek to be broad enough to look at the other man's point of view and be willing to meet him a legitimate half way in any disagreement. It is often well to get together in a difference of opinion and talk face to face. Much of the contention among men is due to misunderstanding, and much of the misunderstanding could be wiped away if men would consent to discuss in a dispassionate way their various differences.

The great thing in dealing with humanity is to control temper and develop patience. If people are disagreeable with us it may be because we do not understand them—let us have the patience to look into their motives. If they are unreasonable it may be due to a mental dwarfing for which they are not wholly responsible, and we should accordingly exercise charity. If they are dishonest it may have been brought about by environment, or by heredity, or by any of the infinite mazes of circumstance or chance which seem to weave the warp and woof of many a poor mortal's fate. Not that we should countenance dishonesty in any man, but that in taking issue with dishonesty we should look beyond the immediate act and try to discern the hidden spring which formed the motive power leading to the transgression. We should aim to correct and to prevent, rather than to punish or take revenge.

A larger vision among men will develop harmony, and greater harmony will bring more certain happiness. There can be, there is, no loftier mission on earth for any man than to smooth the troubled waters of bitterness and strife among his fellows. Take out of the world the petty bickerings and small neannesses of human experience, the envy, jealousy, spite and hatred—take these away and humanity could meet the larger issues of pestilence, or flood, or disaster or crime with greater equipoise and more effectiveness. The spontaneous and magnificent heart-beat of humanity which has gone out to San Francisco in the hour of her trial has buried more of meanness and selfishness and small strife among our people than anything that has happened in recent years, and yet the pity of our state of society when it requires some appalling disaster to give us a larger vision of our true function of life and make us forego our small contentions. When men become broad enough to look out beyond self and see the need of harmonizing the great chaos of humanity they will not require a calamity to stir their souls and fill them with loving kindness.

The chief needs of the human race in small as well as large events are unselfishness, charity and above all an abounding love. To be unselfish enough to think of the needs and rights of others, to spread out through humanity that delightful self-sacrifice and consideration which we sometimes see so perfectly typified in family groups; to be charitable enough to yield to others the privilege of holding opinions opposite to those of ours, to recognize the fact that we cannot all believe alike and that each is entitled to his own particular point of view so long as it does not work to the detriment of others—these are the things which go far to make up that larger vision of life which should be the ultimate aim of all. But even beyond this, though coincident with it—even beyond unselfishness and charity is that rarer virtue, that loftier sentiment called love—the lever which moves the hearts of men above the sordid things of earth and gives us a glimpse of that which we call heaven. And who shall define what this thing is? We know that one man is better than another because he has more love in his heart for his fellowmen. We call it sympathy, affection, tenderness of sentiment, but it is more than this. Love is the embodiment of all the higher virtues merged in one; it is subtler than the ether of the air, and more tangible than the glint of gold. It makes gods of men and even deifies the birds and beasts. It weaves its spell o'er creeping vine and virile oak, o'er ocean's mountain wave and the tiny ripple of a brook. It descends into the shades of valleys, and climbs the highest glistening peaks. It soars aloft into the haze of clouds and goes down with men to the nethermost depths of the caverns of the earth.

Love is the one great hope of the world. Without love we are cinders, dust and ashes; with love we are the essence of all there is of life.

DENTAL EDUCATION IN THE PUBLIC SCHOOLS.*

BY DR. C. E. BYINGTON, HARRISBURG, ILL.

The problem of educating the public to the importance of oral hygiene and the strict care of the teeth has been giving our progressive profession vast concern for years; many theories have been introduced, tested to a degree, and with one or two exceptions, eliminated without any result. But I am going to offer you a plan that I consider rational and practical: Our medium is through the public schools of our land today. True, the intelligent are growing more sanitary in their habits daily, but the utter disregard of dental hygiene is still plainly visible.

Progressive dentists in Massachusetts, Missouri and Mississippi have been making some efforts the last year or two, to induce the law-makers of their respective states to pass a law making the teaching of oral hygiene in their public schools compulsory, but it seems thus far they have been unsuccessful. But with due respect to my native state, Missouri, and the states of Massachusetts and Mississippi, they are lacking in two things, tenacity, and ability to organize, with both of which the profession in this state is abundantly blessed. In fact from the standpoint of organization, through the untiring efforts of Dr. Arthur D. Black and others, we can boast of the proud distinction of leading the union in a well perfected organization and the largest membership. In consideration of this fact let us utilize our forces, for I dare say there is not a state in the union as well prepared at present to make the initiatory step in this matter as Illinois; and let us go at it with a determination, for zeal is the essential qualification for the success of any undertaking.

---

*Read before the Illinois State Dental Society, Springfield, May, 1906.

And now the question is, How may we systematically and effectively carry on this education in the public schools?

Today, in the United States, we have about twenty-eight millions of children of eligible school age—of this number about eighteen millions are in the public schools, about three millions in colleges and the remaining six or eight millions attending no schools at all.

Let us first take up this eighteen millions found in the public schools. It matters not as to the wealth of a school district or ward, how modern or spacious your buildings, you will ever find on entering any room a congested condition, every available seat occupied, a badly ventilated room, as a rule. And what is the result? Thirty minutes after school has opened every breath of air has been inhaled and exhaled into the lungs of every individual in that room, and each time it is emitted, it is more polluted, and ere the noon hour, your children are breathing from a stagnant pool of disease.

Many thousands of dollars are expended each year for systems of school ventilation and the people cheerfully bear this burden of expense because they are convinced of the need of keeping the air of rooms in which their children are brought together as pure as possible. But strangely enough, school authorities have thus far overlooked the important fact that the pestiferous odors issuing from neglected mouths are rendering the problem of ventilation almost impossible of solution. How much money—and what is greater, how much health—might be saved by intelligent attention to the laws of dental hygiene? Yet it is our aim to aid them in every possible manner to attain the highest mental standard. But are we consistent? I say, No! most emphatically.

If you would destroy the fig ere maturity, you need only attack the trunk of the tree; the brain is not developed at the expense of the body, but a physical weakness means a mental decay. For a well balanced condition it is necessary for the individual to have a normal and well developed heart, lungs, digestive organs and brain. And with these facts all admitted, we can readily see the importance of educating the youth to the actual value of dental hygiene. While the care of the children's teeth is a parental responsibility, since their preservation affects not only the comfort, but the health and future personal appearance of the child (for a neglected denture will mar the appearance of the most beautiful, while a well cared for mouth will add an aspect of refinement to the most homely). We can no longer leave it to the parents, for more harm results through loving ignorance and carelessness of parents than we can rectify in after life.

Now to the course we might pursue in reaching them: First, I would favor special dental legislation, letting the power be vested in the governor of each state, or municipality, and above all eliminate politics and select well qualified dental surgeons; their duty should be to lecture once each school term to the pupils, impressing upon them the importance of dental hygiene and stimulating their pride by portraying the marred beauty through this neglect.

This school instruction should be carried on by our profession whether we receive immediate dental legislation or not. The school board, instructors and patrons would appreciate this knowledge and interest shown, and stamp you individually, and the profession, progressive.

I suggested, and the superintendent of our high school has urged me to give them a lecture this term on "The Care of the Teeth," and I have one prepared, and will deliver it before the close of school.

But now in case we receive legislation and dentists are appointed. Cards should be printed giving the diagram of the teeth, and leaving space for name; the teeth are examined by the appointed dentist, and a note made on diagram indicating the teeth that need attention. Also on the card will be printed something to this effect:

"Your child's teeth, as marked on diagram, need immediate attention; neglect may result in much pain, bad school work and an irreparable loss. Kindly place your child in the care of your family dentist ,or notify us and we will direct you. We must have a report on this case."

This can be carried out as a part of the system of school work, and from a special school fund. It would be the best tax a father ever paid, and after once installed, and the good results shown, you could not induce the fond parent to discontinue this phase of education.

A movement is on foot in Chicago to establish a $300,000 school, the express mission of which will be the salvation of the human stomach. A most excellent move, for a man cannot feel better than his stomach, but the greatest factor in abusing this vastly important organ is the utter neglect of keeping the teeth in the proper condition for thorough mastication. And the success of this institution will depend largely upon the stress placed on oral hygiene and the preservation of the individual's teeth.

While we boastingly pride ourselves on our high standard of civilization and progress, we would do well to imitate some of our less boastful and non-progressive countries. Here is some research as given by Dr. H. L. Ambler, of Cleveland, Ohio: "The municipality of Strasburg, Germany, has resolved to build at a cost of $18,000, a dental hospital for the exclusive use of school children. Every child must be subjected to a dental examination on entering school, and twice every school year until the age of thirteen.

"A report on the condition of the teeth of school children showed that in a school of seven hundred pupils, of five hundred, between ten and eighteen years of age, fifty cleaned their teeth twice a day, two hundred and seventy-five used a brush occasionally and one hundred and seventy-five did not own a brush; of two hundred in the primary department, from six to ten years of age, not more than ten used a brush. It is not too much to say that thirty per cent of all teeth of children between the ages of five to fifteen in the public schools of the United States are diseased.

"In Germany twenty thousand children from six to fifteen years of age were examined, and it was found that ninety-five per cent of them had dental caries. In England dental caries is present in seventy-five per cent of the children of the poorer classes. In Paris, France, both medical and sanitary inspection are obligatory in public and private schools, and by virtue of an act of the municipal council, the pupils of the public schools have their teeth examined every six months.

"In Stockholm, Sweden, in obedience to an edict of the king, in 1889, there is a systematic examination of the teeth of school children."

The opportune moment for action has come, and it is a burning shame that decisive action has been deferred thus long, though we have made greater strides during the last decade than any known science or profession; but if we will only take this up as a body and force it through as we are capable of doing, we will soon be recognized as one of the most potent benefactors of mankind.

Let our slogan be "Dental Education in the Public Schools."

Our motto, "We lead, others follow."

CONCERNING THE PORCELAIN INLAY.*

BY J. F. F. WALTZ, D. D. S., DECATUR, ILL.

An invitation to write a paper can be declined, but I have found requests from the program committee's chairman cannot. Being compelled, therefore, to write a paper a subject became necessary and the Porcelain Inlay has been chosen, first because I have for it an enthusiastic interest, and second because in spite of the prominence given its merits in the journals and societies for some time past there are yet comparatively few men who have ever made a porcelain inlay, much less made its use a practice. In view of the crying need for means to overcome the universally recognized evil appearance of the conspicuous gold filling this is deplorable. Hence with the belief that a general treatment of the procedure involved is more likely to gain converts to the work than the consideration of any particular problem or question connected with it I beg to submit the following:

---

*Read before the Illinois State Dental Society, Springfield, May, 1906

A stage has been reached in the development of the porcelain inlay where the place it shall take among present filling materials is believed to be more supplementary than supplanting or universally applicable. Instead of the indiscriminate employment of porcelain the pioneer workers prophesied, we now consider its use should be confined, as a rule, to those cavities where for esthetic reasons gold is impossible. "There is no cavity in the mouth possible to be filled with any material but that may be better or more easily filled with porcelain than any other filling agent"; or, "In the treatment of those patients of extreme nervous temperament where the use of cement is the best that can be done, porcelain will enable us to readily render the most permanent service," and other propositions nearly as sweeping are now seen to have been the enthusiastic utterances of extremists. The porcelain inlay has gained in spite of these extravagant claims rather than through them, for the extremist has here as in any subject attracted the attention of the conservative man who has in turn brought the matter into some perspective.

Experience has proved to most practitioners that the use of the porcelain inlay is without any advantages, if not entirely contraindicated, in positions where heavy masticating strain is to be borne, which at once excludes its insertion in molar cavities, except they be buccal or occasionally mesial. The bicuspid proximo-occlusal, and especially mesio-occlusal cavity, if filled with gold would often result in glaring disfigurement; in such cases porcelain is our best filling agent, but should be used with an explanation to the patient that here its permanency is more a matter of doubt than would be the case with gold—the improvement in appearance, however, warranting the slight risk undertaken. Buccal cavities in bicuspids are unquestionably best filled with porcelain. All classes of cavities in the six anterior teeth constitute the field in which porcelain finds its greatest application. This last statement brings to mind great proximo-incisal restorations upon incisors, the restoration of the incisal one-third or two-thirds of incisors broken away through accident or unusual decay, cervical cavities troublesome to fill with gold because of the difficulty attendant upon successful application of the rubber dam, those perplexing conditions presenting as a result of extended abrasion and sometimes calling for the wholesale building up of both the upper and lower anterior teeth—in short we may consider the porcelain inlay limitless in application in cavities of these teeth excepting those so exceedingly small and inconspicuous that needless sacrifice of sound tooth substance would be necessary in order to make a bit of porcelain of some size, inasmuch as tiny inlays are very difficult to fuse and carry successfully to the cavity and may be considered impracticable. Another exception would best be noted, that of the occasional case where the force of mastication is so excessive that even gold would be flattened or would give evidence of rapid wear. Porcelain has no place whatever in occlusal molar cavities when there is an antagonizing tooth, for its friability invariably results in a progressive chipping away of the marginal edges, resulting in a crevice and a ditch that plainly rules its use out of such positions, moreover the time required to complete a gold or amalgam filling or perhaps gold inlay is less than that necessary ordinarily with porcelain. Esthetic requirements, though not often a consideration in these cases, must be ignored, for they are beyond the limits of present practice.

The inlay has brought its individual set of problems. Some of these have been solved and the procedure involved has been systematized or standardized. Others await a satisfactory solution.

Cavity preparation for the inlay was a bugaboo for a time owing more to lack of knowledge regarding the materials used than to any fault inherent in the inlay principle of filling. Again the fallacious idea at first prevalent that a saucer-shaped cavity or one simply ground out with a stone would retain an inlay when cemented did much injury to the work through the loss of fillings made for such cavities. That fillings depending solely upon cement for retention will in most cases be lost was early demonstrated and the resulting study of cavity preparation has brought the matter of retention to the inlay to a position where the percentage of them lost as compared with gold fillings is probably identical or slightly in favor of the gold filling. This seems a sweeping statement, but experience of inlay workers bears it out, and personally the writer has had in some hundreds of inlays made during the past three years, to his certain knowledge, three inlays lost from their cavities. These three were made within the first month of this time and before he possessed a proper appreciation of the requirements of inlay cavity preparation.

In general the cavity should have its pulpal wall as nearly at right angles to its lateral walls as can be and all cervical or buccal cavities may be made to conform to these requirements most perfectly. In these cases the depth of the cavity should be such that a considerable thickness of porcelain may be secured. In the inlay method the cavity margins, being made so the filling is fitted to them instead of being malletted against them, must be given the utmost care. All bevel should be avoided and the marginal edge should be made as nearly as can be so that none of the enamel rods are cut across but are all left standing upon firm dentine. The cavity marginal edge resulting is thus like the edges of a perfect cube. The inlay, when made, has a similar marginal edge and when fitted in the cavity makes the strongest adjustment of inlay margin to cavity margin. That this adaptation may be absolute the cavity margin must be first carefully chiseled, then made smooth with stones as corundum, or better the "gem" points used with water and finally polished with Arkansas stones and fine cuttlefish disks. This to be done thoroughly requires frequent examining with a fairly strong lense, thus bringing to view many roughnesses that had previously seemed perfectly polished surfaces. Such treatment of marginal

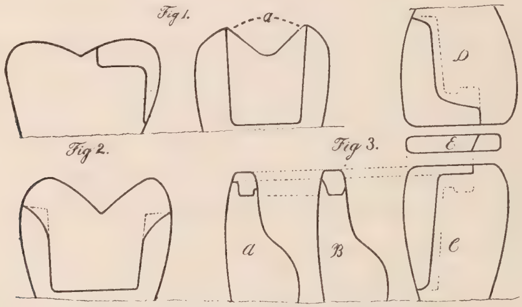


Fig. 2. Dotted lines represent incorrect preparation.

Fig. 3. "A" shows incorrect preparation of incisal seat, while "B" shows proper preparation, allowing maximum bulk of porcelain to protect the enamel. "C" and "D" are labial and lingual views respectively, the dotted line representing the pulpal wall. "E," the incisal edge, showing diagonal course of margin.

edges aplies to all inlay cavities and too much care cannot be put upon their preparation.

In proximo-occlusal cavities in molars or bicuspids the general shape of the cavity can be made essentially the same as that for a gold filling, avoiding all undercuts through the use of round burs. The cavity may be freely outlined in conformity with extension for prevention doctrine, and in this class of cavities the proximo-lingual and proximo-buccal cusps must be ground with small carborundum stones so that any frail enamel in these regions may be completely covered with porcelain. Fig. 1. This avoids as well the frail edges of porcelain at A. and greatly lessens the danger of fracture of the inlay. Those portions of the lingual and buccal margins at right angles to the long dimension of the tooth should be prepared so as to admit of the greatest possible bulk of porcelain being built over them. Fig. 2.

In simple proximal cavities in the anterior teeth the preparation whenever possible should be such that the filling may be introduced from the lingual. This leaves a strong wall to oppose the prevailing stress acting toward dislodgment and has the abvious esthetic advantage of bringing a minimum of filling into view. The lateral walls must be as nearly at right angles to the pulpal wall as possible and the cavity made to approximate the shape of a box as closely as conditions will permit.

Proximo-incisal cavities should be given a flat base or one somewhat inverted—V-shaped—which allows the filling to be most securely seated or locked into place when the force applied against the incisal edge is the greatest. Many times teeth presenting these cavities are pulpless and this makes it possible to carry a heavy bulk of porcelain into the former pulp chamber. The incisal portion of the pulpal wall should be grooved, at least slightly, to offset forces acting at right angles to the long axis of the tooth to dislodge the inlay. Often in vital teeth the restoration to be made is so great as to require the filling to be carried over the incisal edge as is similarly necessary with large gold fillings. In these cases the labial plate should be shortened and covered wth a sufficiently strong thickness of porcelain made as heavy as possible by preparing the enamel plate as in figure 3. The lingual plate may be cut away as extensively as required to secure adequate anchorage.

Cavities made for restorations of abraded surfaces are as simple as the cervical cavities, and their forms will be governed so largely by particular conditions that a description need hardly be attempted. One feature I am strongly opposed to, however, is the employment of a pin or post fused into the inlay. Such practice is never necessary, and makes for weakness in the filling more than is ever gained in strength of retention. Finally, cavities may be so prepared in most instances that the prevailing stress acts to drive their fillings more securely into the cavity and when tried in place before cementation the fillings may not be rocked or moved in the least. Such preparation clearly places the smallest amount of strain upon the cement and gains the greatest amount of retention in the cavity form—a state of affairs the inlay worker should always strive to attain to the fullest extent.

The making of the matrix brings up for consideration the grade of porcelain to be used—high or low fusing. Certainly that grade should always be used with which the individual may secure the best results, but from my own observation and personal experience I have come to the conclusion that equally as artistic results are possible with the Jenkins porcelain alone as with any other, and in most hands these results are more readily obtainable. Graduating from and subsequently three years one of the infirmary teaching corps of the Chicago College of Dental Surgery, I firmly believed in high fusing materials and methods, and considered high grade work could result only from the employment of such methods. Consequently when later I spent a year with Dr. Jenkins in Dresden and observed scores of inlays making restorations in every conceivable form of cavity in all positions in the mouth, and having done service eight to ten years and some longer, I was amazed and soon revised my porcelain creed. What I saw there convinced me beyond a doubt that Jenkins' materials secure unexcelled results, and observation and experience to the present time has confirmed and accentuated this belief. What the Jenkins material may lack in exact matching of the shades of the natural teeth is made up by the ease with which it is built up and fused and the entire absence of any tendency to form bubbles in the process. Further, a gold matrix may be used and this in itself is so great a boon as to bring Jenkins' materials into wider use. The writer must state he has not worked the Brewster gold matrix porcelains, but has observed excellent inlays made of them. The assertion is made by authorities that platinum possesses superiority over gold as a matrix material and that it may be fitted in any cavity as easily and rapidly as gold. After considerable experience with both metals such a statement seems ridiculous and appears proven so when a devotee of the platinum matrix is observed giving a clinic on this subject. He commonly employs parts of several sets of instruments especially devised for the purpose, anneals, and reanneals, and then perhaps after the first baking carries the matrix to the cavity for readjustment. To fit a gold matrix is very simple and requires no special instrument unless it be the ball-pointed inlay pliers. Using these, a square of No. 30 gold foil sufficiently large is taken and with very small bits of moistened spunk carried to the bottom of the cavity, then with additional spunk and pressure fitted accurately to the floor; care must be taken not to outline the margins before this has been accomplished. Any folds should be smoothed out as completely as possible, though if some minor folds are left they may be burnished to the average thickness of the matrix. Then the gold should be carried over the margins with spunk—no general burnishing of the gold with instruments should be done else an objectionable springy temper is developed. When this stage is reached the matrix may be withdrawn and such bits of the gold cut away as would seem likely to interfere with its final removal from the cavity. However, as much gold would better be left as may be to reproduce the tooth form for a guide in building any needed contour. Carefully replaced in the cavity the matrix is packed with gum camphor (the Japanese camphor seems best for this purpose) until flush with the margins. Then with round pointed burnishers the camphor is drawn down over the margins until they are accurately and clearly shown in the gold. An explorer is forced well into the camphor and the matrix clinging tightly to it is thus removed from the cavity and carried to the laboratory to be invested with an asbestos and water mixture in a fusing tray or pan. This is quickly and easily done—the water is slowly evaporated from the investment, then the camphor is burned away, leaving revealed a matrix which represents a perfect impression of the cavity and one which absolutely can not change form during the process of fusing. The feeling of security the investment lends the work is a positive pleasure;

no thought need be given to any effect shrinkage of the porcelain may have on the matrix—the investment provides against this and the camphor has made it certain no distortion can have occurred as the matrix was carried from the cavity to the investment. Any tears in the matrix are immaterial provided the margins are not involved—the porcelain will flow and fuse perfectly over them unless the openings are very large, in which case a small pellet of gold may be easily patched over the aperture made by the tear.

Inlay work requires much separation—one feature of the work which is a *sine qua non.* For this purpose the writer believes immediate separation should invariably be used and this may best be accomplished with the Perry separators. The general form will answer in the great majority of instances, though occasionally individual forms of that separator adjust more suitably. Base plate gutta percha packed between the teeth and the separator bows prevents slipping of the beaks rootwise into the gum and also renders the separator firm and steady. The separator is adjusted previous to the cavity preparation and kept in place until the inlay has been set. This method does away with special visits to the office for separation—saves the patient the misery of sore teeth for several days, and is generally so much better as to make any other method seem a departure from good practice.

When the saliva is kept from contact with the teeth the tooth-color is soon observed to have become much lighter. This requires the exact determination of the tooth shade to be made at the very beginning of the operation. At this point one is confronted with a consideration of the most perplexing feature connected with porcelain inlay work—the shadow problem due to the opacity of the cements. Were it not for this, or if we possessed a translucent cementing agent, invisible fillings would be easily made, whereas now an inconspicuous filling is all one would better promise a patient. The situation is briefly this: imagine the distal surface of a right upper central incisor filled with porcelain and the patient standing so that the main source of light is from the left. Now, inasmuch as the tooth transmits light after the manner of opalescent glass the rays of light penetrate to the retaining film of cement; this being absolutely opaque checks at least all direct rays and consequently the filling is in a shadow. In case the porcelain had the exact color of the tooth the effect in this instance would be to make the cavity appear not filled. To appreciate the effect of this shadow on the appearance of the filling requires some experience. Subsequently the selection of the proper shade for an inlay will be made with this effect foremost in mind. In general all distal fillings should be lighter than the tooth color in order to neutralize the darkening shadow cast by the cement. In case the cavity is large and the filling in being brought over the labial surface to the median line will receive some direct rays of light, the shadow is not so intense of course and the color must be nearer that of the tooth. All mesial fillings if to be well in view must generally be slightly darker than the tooth—this is also true of labial fillings. The movement of the lips upward and downward in front of the teeth as a curtain and the drawing of the corners of the mouth backward in speaking, smiling and laughing, constantly varies the intensity and directness of the angle of the light rays entering the filling and thus often makes a very perplexing question of the shadows cast by the cement. Restorations involving the incisal edge, if of any considerable width mesiodistally, are usually extremely satisfactory in appearance, for in any position some light rays enter the porcelain at so nearly a right angle the true color is constantly seen. Again, anterior cervical or labial fillings are often very disappointing, for if the direct light thrown on them when the lips are drawn beyond the gingival border reveals a satisfactory appearance the occasional view given of the filling in speaking with the light rays reaching it at varying obtuse and acute angles will make it plainly visible, though perhaps not conspicuous to the casual observer, and never glaringly so, as would be the case with gold. Experience enables one to largely control this feature, though there are positions entirely too numerous where the restrictions placed upon the work by this problem make one fervently hope a translucent cement or other solution may be near at hand. A shade guide is probably best used merely to indicate or suggest the shade of the tooth, the operator then making that selection of porcelain bodies in the laboratory which his eye conceives will make proper harmony with the tooth as represented by the shade of the guide before him, at the same time estimating the probable effect of the cement shadow. The first color may be a yellow dentine shade and this built up until the thickness of the enamel yet remains when the proper shades are begun—or the filling can be modified in color by the nature of the first layer. This is not a task for the ultra-skillful alone, only accomplished after a tedious study of layers and combinations of colors, as many articles would seem to indicate, but rather a process any capable, careful dentist can carry out. Usually the shade desired is only gained by combining two or three shades, the resultant being a blend that approximates the tooth color better than will any one shade used from matrix to the final fuse.

The fusing of the Jenkins and other low fusing porcelains must be carefully done in order not to over-fuse and burn out the colors. The temperature required is so much lower than the glaring white heat needed for the high fusing materials that the exact degree of heat can be more easily seen. Thus the greater liability of the colors burning light is a disadvantage that is some lessened by the ease with which one may judge the degree of heat being applied. Jenkins' body shrinks greatly in the first bakings, which should be carried only to the biscuit stage. This shrinkage seems often to have been considered an objectionable feature, but by this property of condensing itself into smaller space the porcelain apparently attains that density and homogeneous condition that is so desirable in the finished filling. The body is so quickly and easily built up and made ready for a fuse and then fused that the question arises why shrinkage should be thought any objection whatever. The filling can sometimes be finished with four fusings, but usually one or two more are needed, the highest heat being applied in the last fuse to secure an even gloss rather than a glaze.

The gas furnace is used most commonly with Jenkins' materials and has given most satisfactory results because the heat can be regulated so easily that the chances of over-fusing are minimized. This is true of the gasoline furnace as well. Furthermore, the Jenkins shades were developed and determined through experiments made almost exclusively with the gas furnace and hence better results with them are secured in the operator's hands by this means. Before the fusing pan and its matrix and investment are enveloped in or surrounded by heat it is necessary in order to secure in them an even temperature that the heat should first be applied from below for a few seconds. Otherwise the porcelain body is likely to be overheated in bringing the investment up to the temperature necessary to secure the proper fuse of the porcelain body. The ordinary electric furnace acts in this objectionable manner, radiating heat as rapidly from above as from below, thus often bringing portions of the porcelain to a fusing heat before other portions placed deeper in the investment are fused. Dr. Custer has devised an electric furnace in which the heat enters the fusing pan and contents from the bottom and sides and not at all from above, thus making it certain the investment is evenly heated throughout when the porcelain fusing temperature is reached. Recently Dr. Roach, of Chicago, has brought out an ingenious electric furnace in which a temperature once secured can be reproduced any number of times, and the claim is made that by its use a color once secured can be always reproduced. Though the writer has had no personal experience with this furnace, it would seem to promise a better means of fusing the Jenkins porcelain than has yet been devised. In these days when electrical appliances are accepted as the latest improvement, to use a gas furnace may seem to place one rather back in the ranks, but an appreciation of the special requirements of the invested matrix with its lower fusing body is necessary to successfully or advantageously replace gas with electricity in this instance.

The inlay having been finally fused is allowed to cool slowly to avoid any brittleness a sudden cooling might produce, then the matrix is stripped off carefully after being immersed in water. Dr. Head's experiments, as published in the July, 1905, *Cosmos,* seem to prove the greatest adhesion is secured when Harvard and Ames inlay cements are used with the cavity surface of the inlay etched and heavily undercut and the cavity walls roughened. This can always be done in such manner as to secure the effect that would obtain were pins with heads fused into the inlay. For this purpose steel wheels charged with diamond, such as are made by Ash, are preferable to copper wheels similarly charged, because of the very objectionable black debris left upon and in the porcelain by the use of the latter. The S. S. White vulcarbo knife edge disks serve the same purpose. Etching with hydrofluoric acid is in my opinion unnecessary, a very similar surface being secured by carefully removing most of the glaze with the diamond or other wheels. The inlay being ready to be fixed, the surface of the cavity should be roughened and rather undercut in such manner as to secure grooves or pits opposite the grooves of the inlay, thus making the cement bond similar in effect to the key which binds a wheel upon its shaft. The cavity and inlay being washed with alcohol and dried, are ready for cementation. The cement should be carefully and thoroughly mixed and first applied and rubbed with an appropriate burnisher over the cavity surface of the inlay, carrying it well into all grooves, then the cavity being rubbed with cement the inlay is carried to position and pressed home. For this purpose an orange wood stick should be used, for in case of the glancing or sliding of a metal instrument a marginal edge might be chipped and ruined. Firm though not excessive pressure should be maintained against the filling for several minutes, then the excess cement removed and a film of paraffine melted over the filling if Harvard cement has been used. This will keep the saliva away until complete crystallization of the cement.

At a subsequent sitting uneven margins may be carefully finished first with the wet "gem" stones, then with Arkansas stones and finally polished with cuttle fish disks. A sitting for this purpose may usually be avoided by wedging the filling to place previous to setting and very carefully using the stones or cuttle fish disks—or these may sometimes be used shortly after cementing the filling. The work should be shown the patient in the normal light and with a natural position of the lips as near as can be and with the mirror held two or three feet from the face. The lightened color of the tooth due to its partial isolation from moisture should be pointed out as well as the fact that after some three or four weeks an improvement in appearance will have taken place, owing to the cement film having dissolved a trifle, thus allowing rays of light to penetrate to an increased extent and producing a more lifelike and pleasing effect.

In conclusion, the disappointments of the work may be considered. Foremost under this head are the discouraging effects due to the cement problem, but in the hands of an operator of some experience the worst of these is the very greatest improvement over any effect obtainable with gold or gold and platinum. Then, again, an inlay that was especially pleasing when inserted is often seen within a year to be outlined by a line of the dark stain most commonly observed upon the gingival surfaces of a set of teeth perhaps otherwise free from deposits—the line of stain having formed in the crevice left by the slight washing out of the cement. Usually the means employed to remove this stain from the teeth is effective about inlays, but its existence has a regrettable effect upon the appearance of this work. Many times those cases in which it is necessary to carry a margin over the incisal edge returns distressingly affected—the heavy strain against the cutting edge perhaps has washed the cement excessively and may have caused some slight chipping, which together make a condition when stain has gathered that is very disappointing. For this reason cavity preparation in these cases should bring as little length of margin over the incisal edge as possible. After a long period of wear, or in cases where erosion has taken place, porcelain inlays are found much higher than the surrounding tooth surface—a condition due to the unequal wearing qualities of the two substances. This condition is seen rarely with gold or amalgam because these materials seem to wear away nearly as rapidly as the tooth substance. Further, it matters not how accurately the work may have been done, the cement line is always distinguishable when passed over with a fine explorer point, and to a gold worker, whose standard of marginal finish requires there should be no perceptible difference to the feel of the explorer, this is disquieting and a thought of the sealed and moisture-tight nature of the inlay joint is needed as assurance that "all is well."

Finally, every practitioner must make porcelain inlay work or some other equally esthetic method which may come as an improvement a part of every day practice, and that this be done soon is of great advantage to both our patients and our profession. It is unfortunate that there is prevalent such a hesitancy over the adoption of porcelain as a filling agent—a hesitancy in part due to a feeling of uncertainty as to the permanency of porcelain operations, but much more attributable to timidity in undertaking a work that is believed to entail a very different, difficult and intricate technique. If this paper has done anything to correct this erroneous view and incite any one present to become an active porcelain worker it will have done a real good.

ON THE COMPOSITION OF THE DENTINE AND ENAMEL OF HUMAN TEETH.*

BY J. E. HINKINS, M. D., D. D. S., CHICAGO, ILL.

In the prosecution of our researches on the erosion of tooth structure and cement fillings, it became necessary to have an accurate knowledge of the composition of the enamel and dentine of the human tooth.

If any attempt were made to determine in cases of erosion just what constituents are dissolved out of the teeth most readily by acid or alkaline salivas or similar solutions prepared synthetically, it would obviously be necessary to know accurately not only the percentage of each inorganic constituent, but also something of the nature and amounts of the organic contents and of the constituent water in the teeth.

While a few analyses have been published by Hoppe, Seyler, von Bibra, Berzelius, Gallippe, and others, these varied so much among themselves that it was evident that either human teeth vary markedly in composition, or that the conditions under which the analytical work was performed varied greatly among the different scientific workers. Furthermore, the workers along these lines have paid little or no attention to the composition and properties of the organic constituents of the teeth. So far as the writer is aware, no determinations of the per cent of carbon, nitrogen, hydrogen or sulphur have been made. Since teeth contain water mechanically included, as well as in chemical combination, and since the amount of the water given off will depend upon temperature and fineness of material, it became evident at once to the writer that the conditions of treatment of the teeth and analytical work must be laid down and adhered to throughout, if consistent results are to be obtained. It is evident that the fineness of the powdered tooth dentine or tooth enamel would play a great role in the results obtained in the determinations of the per cent of water, for example, or in the per cent of carbon, hydrogen, nitrogen and sulphur obtained by combustion methods.

---

*Read before the Illinois State Dental Society, Springfield, May, 1906.

This paper may be considered a preliminary report of the results so far obtained, and of the methods to be used in future work on the study of the erosion of the tooth structure.

The material analyzed was prepared as follows: The teeth selected were cleaned thoroughly in water, and freed from adhering flesh or gum particles by scraping them well. As nearly all of them had some decayed portion, this was thoroughly removed, so that only solid structure remained. No markedly discolored teeth were used. The pulp was removed in all analyses.

As it is evident that some water is mechanically enclosed in the teeth, and that some is in chemical combination, experiments were made to determine the difference in loss of water in a vacuum and in a drying bath at 110° C. A sample of 38.7112 grams of whole teeth was dried in a vacuum eleven days. In this time the loss was 2.024 grains, or 5.23 per cent of moisture, which was lost in vacuo. In order to learn the amounts of water which vacuum dried teeth lose at 110° C., a sample of 57.030 grams whole teeth, which had been dried in vacuum, was heated eight hours at 110° C. The loss in weight was 4.100 grams, or 7.19 per cent water, part of which was without doubt water of crystallization or constitution.

In order to see the influence of the size of the particles on the amount of water lost at 110°, a sample of the dentine of teeth which had been dried at 110° was pulverized in a mortar, till all passed through a sieve having 40 meshes to the linear inch; 24.245 grams of this was dried at 110° C. to constant weight; the loss was 1.178 grams, or 4.86 per cent, over that lost by whole teeth at 110°. It is plain, therefore, that the fineness of the division of the teeth will play a very important role in affecting the results obtained. In order, therefore, to make my results uniform, I analyzed dentine and enamel which passed through a 40-mesh sieve and was dried to constant weight at 110°. It will be seen that vacuum dried teeth lost about 12.00 per cent of water when pulverized and dried at 110°. The air dried whole teeth lost about 5.00 per cent in vacuum, about 7.00 per cent when dried as whole teeth, and (dentine) about 5.00 per cent when pulverized and dried—or about 17.00 per cent of water. This dentine was analyzed and the data are given below.

A sample of pulverized enamel, dried in a vacuum, was heated to constant weight at 110°; 6.6445 grams lost 1.021 grams, or 15.37 per cent.

It will be seen, then, that the air dried teeth that were analyzed lost about 15.50 to 17.00 per cent when pulverized to pass through a 40-mesh sieve and dried at 110°. If the material were pulverized finer there would without doubt be a greater loss in weight at 110°. This work will be up in the future, as I expect to continue this line of study.

A description of the analytical methods employed will make the work clearer. The *ash* was determined by igniting a weighed portion of the dentine or enamel to white heat. The ash was always colored dark gray or nearly black; the cause of this has not yet been determined, but will be. The loss in weight by ignition is made up of water, carbon dioxide, fat, and other organic matter, probably albuminous in nature, and perhaps other substances not yet determined.

The carbon dioxide was determined by treating the substance with acid and collecting the liberated gas in Geissler potash bulbs. The phosphoric acid was determined in the usual way by means of the magnesium ammonium phosphate reaction. The calcium was determined by precipitating it as calcium oxalate and titrating this by means of N/10 potassium permanganate. The magnesium was determined as magnesium ammonium phosphate. The silica was determined as usual. As far as I know, the iron and alumina, sulphur, chlorine, sodium, carbon, hydrogen and nitrogen have been determined by me for the first time. It is true that Berzelius gives an item "sodium salts" in his analysis of dentine (Tome's Dental Anatomy, Sixth Edition, page 47), but a glance at the analysis shows that this item is really made up of the difference between the actually found percentages of the known substances and 100 per cent, and should be called "unknowns." Instead of Berzelius' 1.50 per cent, sodium salts, we find 0.63 per cent sodium. The per cent of carbon and hydrogen was obtained by the regular combustion method. The per cent of nitrogen was obtained by the Dumos combustion method. The sulphur was obtained by two independent methods, involving different principles, and the agreement is very good. In one case the sulphur was determined by Glaser's sodium peroxide method, and in the other analysis by Morse and Gray's combustion method. The results make it very probable that this sulphur exists as "organic sulphur" and not as sulphates. The nature of these sulphur compounds will be a subject of further investigation by me. I have definitely established the presence of chlorine and sodium in the teeth and determined the amounts, which are small.

A word here in regard to the *fluorine* contents of the teeth. The various analyses of the teeth given by others have shown varying amounts of fluorine, but it is the opinion of the writer that the methods employed by others in the determinations of the fluorine are open to very serious objections. The writer is therefore engaged on a new method for the determination of this substance, and this will be reported later.

There must be other substances present in small amounts in the tooth structure which have not yet been identified. The difficulty of determining these small quantities is much greater than that of the work given you now. But the writer is continuing this work and hopes to present detailed results later. The study of the nature of the organic constituents of the teeth will be made a specialty. The writer feels that too little attention has been paid to this part of the work, and that it is only by a careful investigation in this direction that we shall be able to understand more thoroughly the nature of the decay and erosion of the tooth structures.

The results of my analyses are given in tabular form. Instead of the older system of tabulation, in which it is assumed that the substances exist as calcium phosphate, calcium carbonate, etc., in definite proportions, the more recent method of tabulation of the elements or acid groups is given.

DENTINE.

I. INORGANIC CONSTITUENTS.

Ash by ignition	71.30
Ash by combustion	72.04
Ca—calcium	26.99
Mg—magnesium	0.799
$FeALO_3$—iron and alumina (oxides)	0.036
Na—sodiun	0.63
PO_4—phosphate radical	40.25
Co_3—carbonate (Co_2=36.2 per cent)	4.98
SiO_2—silica	0.10

S—sulphur	0.324	
Cl—chlorine	0.10	
Total non-volatile found by analysis		70.60
Ash by ignition		71.30
Difference, fluorine, etc., to be found		0.70

II. ORGANIC CONSTITUENTS AND WATER.

Total volatile matter by ignition	28.70
Total volatile matter by ignition in combustion	27.97
Total volatile, carbon dioxide, water and organic matter (by combustion)	27.97
Carbon dioxide	3.62
Organic matter and water	24.35

III. ORGANIC COMBUSTIONS.

(1) *40 Mesh Dentine.*

	I	II
Ash	72.04	72.01
Total volatile	27.96	27.99
Carbon	14.25	14.26
Hydrogen	2.46	2.46
Sulphur	0.16	0.16
Nitrogen	0.04	0.04
Fat	0.01	0.01

(II) *100 Mesh Dentine.*

Ash	78.00
Total volatile	22.00
Carbon	11.92
Hydrogen	2.11
Sulphur	.20
Fat	....
Nitrogen	....

ENAMEL.

I. INORGANIC CONSTITUENTS.

Ash, by ignition	94.33
Organic matter, water and carbon dioxide	5.67
Carbon dioxide	2.16
Organic matter and water	3.51

Ca—calcium	36.34	
Mg—magnesium	0.25	
$FeALO_3$—iron and alumina (oxides)	0.09	
Na—sodium	0.29	
PO_4—phosphate radical	53.60	
Co_3—carbonate radical (Co_2=2.16 per cent)	2.92	
Sio_2—silica	0.10	
S—sulphur	0.211	
Cl—chlorine	0.08	
Total non-volatile found by analysis		91.72
Total non-volatile found by ignition		94.33
Difference, fluorine, etc., to be found		2.61

As was stated at the beginning of the paper, this announcement is preliminary to a continuation of our studies on erosion of tooth structure and cement fillings. Now that I have ascertained more accurately the composition of the teeth, the work of studying the erosion of tooth structure will be much easier. We shall next take up the question as to what constituents are dissolved most easily, and in what proportions by the acid and alkaline salivas, and as far as possible the various conditions modifying such actions. As this can be accomplished only by painstaking, exact quantitative work, it can not be done rapidly. But these researches will be continued as well as possible, and I hope to present my results to you some time in the near future.

ECHINACEA PURFUREA, ECHINACEA ANGUSTIFOLIA, ECHAFOLTA.

BY DR. A. C. HEWETT, CHICAGO, ILL.

It is in compliance with a request of the editor of this journal and in fulfillment of a promise given him that I write the above five words, and what follows.

I doubt not that those readers who know me personally and honor me with confidence and friendship will "smile" the interrogation, "Can these things be?" and strangers who read this, charitably inclined, exclaim "Enthusiast, with a fad beguiled."

Nevertheless, if after reading they shall revert to the five unfamiliar words (to most dentists), memorize their orthography to ready rememoration, some may be induced to study and try plant and product, learning by daily recurring need for Echafolta in their practice, as I have learned, then I can well afford to await the verdict of such learners, be they friendly acquaintances or strangers careless of "smiles," incredulous, or "pin pricking" criticism. So far as I know and believe, I am the first and only one of our specialty (dentistry), home or foreign, to make a study of and to advocate orally the use of Echafolta in conventions and by publication in dental journals. Hence I may plead excuse for a free use of the pronoun, first person, singular; and hence again the "authority" for dental uses of Echafolta must be drawn from my personal experience alone and from the published testimony of medical practitioners, suggestions for general uses.

My own observations cover a connected period of about ten years. Testimony, medical, dates back to 1870.

MEDICAL PROPERTIES AND USES.

What are they? In answer I quote from a published statement of the authors of Echafolta, Lloyd Brothers, of Cincinnati, Ohio, with two ℞'s and directions, which I *endorse, verbatim et literatum*:

"To correct blood depravation; tendency to sepsis and malignancy; tendency to gangrene, sloughing and phagedena; foul discharges with weakness and emaciation; bluish or purplish discoloration with a low form of inflammation. Especially applicable in the depraved states of the fluids in typhoid and other adynamic fevers, and in malignant carbuncle, cerebro-spinal meningitis, pulmonary gangrene and purulent salpingitis."

"Internally:

℞	Echafolta	ʒij
	Water	℥jv
	Mix.	

Dose: Teaspoonful every hour in urgent cases; every four hours in chronic troubles.

"In all cases of blood depravity, typhoid fever and septic poisoning, add one drop of Echafolta to the water each time the patient drinks.

“Externally:

℞	Echafolta	fʒij
	Water	℥iij
	Mix.	

“Saturate, compress and apply every two hours.”

To the terse grouping of properties and uses quoted I shall add a specialized one learned by experience my own, in “proving” the effects curatively on myself and on numerous other of human and brute life.

DESCRIPTION, INDICATIONS AND USES.

Echafolta is a permanently clear “specific” tincture; a charming liquid of a pale orange tint, remaining clear in distilled spirits, ether and chloroform, but seemingly only miscible with water in medicinal percentages, changing color to a translucent opaline hue, but losing none of its medical virtues thereby. It has a slight alcoholic odor. The root of Echinacea Angustifolia is used in its preparation.

It is not unpleasant to taste. If in full strength it is placed on the tongue, a vibratory tingling sensation is caused, followed by a distinct, though slight, analgesia of the part covered.

Hypodermically used upon myself of from one to fifty per cent mixture with water, results have followed each experiment with nearly identical symptoms and sequalæ, amount injected and tissue considered.

Intradermal, subcutaneous and intrastitial injections caused practically uniform symptoms considering tissue involved in the irrigation.

Within the “Zone of Absorption” following the needle’s thrust was pain, distinct, but easily borne and of short duration. Within the said bounds peripheral nerves were analgesiated close to the condition of anethesia; and within said bounds capillary circulation and also that of the reticulated system of veinlets and arterioles became inoperative.

Peripheral nerves regained normal activity in ten to thirty minutes, time depending upon impinging pressure. Resumption of capillary and sanguinous circulation occurred later on. In no case have I known suppuration or sloughing to supervene.

Echafolta is absolutely non-toxic; safe in any dose—homeopathic, allopathic or Thompsonian.

Echafolta is an antitoxin of vegetable origin, stable in its constituents, pure and potent for cure, hypodermically or otherwise. A sample aged a year, as bland and as reliable as when first manufactured.

What a contrast in expense and convenience to the antitoxines *Equine, Bovine, Capra,* or of any other animal.

Echafolta is anti-venom, sure and reliable. If taken internally and applied at once to wounds caused by bites of venemous serpents, reptiles and insects, Echafolta neutralizes the virus so that scarcely any swelling or inflammation follows the trauma.

Note.—In case of the Asp or Echidna Oscelata, thought by scientists to be the same, I have had no experience or testimony, and therefore do not include it in this statement. Painless death follows its bite in one to three minutes.

Wounds from the bites of mosquitoes, the stings of the honeybee, wasp, kiss-bug and hornet are promptly cured, and the pain resultant almost immediately relieved.

Note.—I do not know, but firmly believe, that Echafolta would be prophylactic of yellow fever from the bite of the mosquito which is said to convey the germ. If so, no suggestion is needed.

Echafolta is a sure cure of the irritation and inflammation caused by Rhustoxicodendron of the three-leaved ivy vine, or the variety growing low in beds. It is also prophylactic of such influence if taken internally and rubbed over exposed surfaces, previous to an outing and camping.

Echafolta used in smallpox tends to abate the fever, quiets the itching and prevents pitting, a fact of inestimable importance.

BLOOD DEPRAVATION.

To correct which the author of Echafolta gives in his generalization of properties and uses means more to those who have used it to combat diseases rapidly fatal, and terrible in percentage of fatality than it does to the casual reader; I refer to empyæmias proper, as shown in carbuncles, cerebro-spinal-meningitis; in so-called black erysipelas and measles, in malignant diphtheria and "blood poisoning" from dissection wounds, and wounds that are pus-forming or grown gangrenous.

In conversation with a surgical friend of distinction I made the assertion that if Echafolta were skillfully and promptly prescribed and used, not another death need occur from blood poisoning. He seemed shocked and replied: "I hope for your reputation that you will only repeat that to your best friends." I rejoined, "I believe it; I do not hesitate to reiterate it," adding as explanatory.

"Of course, Echafolta will not resurrect the moribund, nor will it arrest death when once begun. Blood poisoning may co-exist with other fatal maladies causing failure of any and all remedies, but the statement is as safe as would be the ones that 'Quinine will arrest ague,' 'Calomel will stimulate the liver,' or 'Ipecac will produce emesis'; and standing in the light of my experience, and of sound logic, as I confidently assert that if Echafolta were skillfully and promptly prescribed and taken, no hydrophobia would follow the bite and wound from a 'mad dog,' nor would tetanus supervene the thrust of the rusty nail or follow a Fourth of July accident.

"I know these are strong assertions. I am also aware that if they are erroneous, I assume a heavy burden of responsibility in making them, for time wasted with inefficient medication is lost opportunity, and like "time lost," it can not be regained. Nevertheless, were I to withhold my testimony I should incur a weightier choice. I am not mistaken. 'I speak of what I do know, and testify of what I have seen.' "

It may and doubtless will occur to readers of this journal that the foregoing seems more appropriate for the columns of a medical journal than in this. If so, it is along the line of what the editor of the DENTAL REVIEW has said, better than I can give it without quoting him, concerning a broader dental education and acquirement. The facts above stated should be known by every dentist in the world. Every dental practitioner is daily using explorer, excavator and bur. Points, edges and blades are sharp and sometimes wound soft tissues near. Infection carried to such a trauma by careless operator or patient (often the latter), and a full rigged "blood poisoning" may sail in. Who but the dentist should "clear decks" for action? Should the patient, ignorant of the danger, be sent or left to go home unwarned and unsupplied with prohpylactics? Hours may pass before the disease is recognized and a doctor sent for, the while microbes by the millions are proliferating, and one hour at the attack is better than a week later on. Echafolta, safe, *sure.* Should not a dentist know?

It is worthy of note in passing that Echinacea, of all remedial plants known, so powerful for good, and yet in all its properties safe, stands out alone.

The white hellebore has its vegetable alkali, veratria, a poison. Aconite, wolfbane, monkey-hood, that plant poets name in verse, which is lauded by homeopathists and should be esteemed by physicians of all schools, contains a poison, so insidious in small doses that it defies all efforts at detection save by sensitized paper, invented by Dr. Dendron. (Emile Garboreau in "The Mystery of Orcival.")

Beladonna, deadly night shade, carries atropin, a heart stimulant and also a deadly poison. Stropanthus, with its stropanthin, another heart stimulant, is a still deadlier poison. Nux vomica has its strychnia. The poppy, with its morphin; iris virsicolar, its iridin; may apple, its podophylline; three-leaved poison ivy and ground ivy. Rhustoxicondendron is a scourge of the woodlands. Erythroxylon coca, yielding cocain; yellow jessamine, gelseminum sempervirin, potent to abort fevers, and yet so dangerous to administer curatively, unless given in homeopathic doses. Look where you will in vegetable or mineral remedies, potent as remedial, powerful for destruction, is the rule. There may be exceptions, but Echinacea, so far as is known, is without a rival for remedial potency, void of evil.

In my next I will give a description and cut of the plant Echinacea, some clinical experience of my own, and evidences of others with names and residences, and subjoin directions for use, with recipes and combinations that I have found useful, not only to dentists, but to physicians and surgeons.

(To be continued.)

EXTRACTING IMPACTED LOWER THIRD MOLARS.

BY W. T. CHAMBERS, D. D. S., DENVER, COLO.

A satisfactory method of extracting impacted lower third molars will probably never be found. To remove them without injury to the second molar and adjacent tissues remains a difficult operation.

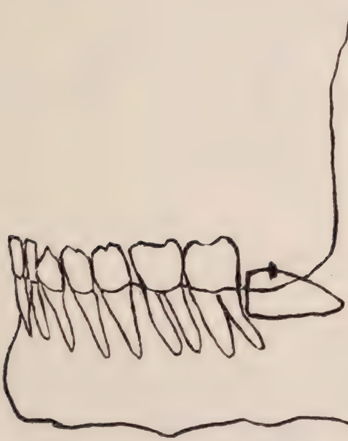


Fig. 1.

Fully twelve years ago Dr. Slonaker, of Chicago, advised devitalization of the third, and by diamond disks or stones cutting off part of crown, which would permit remainder of tooth to come forward toward second molar, the amount of crown removed determining the distance. Those who have attempted the use of disks and stones for this purpose have found how difficult it is to use them of sufficient diameter to cut the crown of third molar and at the same time not lacerate the cheek and tongue. If the crown of second molar is long, or standing much above the third, the difficulty is increased, as the diameter of stone or diamond disk must be increased to reach the third molar.

During the past year several have been removed in the following manner: With a sharp edge stone or diamond disk, the enamel of the exposed portion of the crown of the third molar is penetrated to the dentine (Fig. 1). With a spear headed drill in the contra angle hand piece a small cavity is made in the dentine. Larger drills are now substituted until a good sized cavity is secured, depending upon the sensibility of the tooth (Fig. 2). The object is to get a cavity that will enable the operator to apply arsenic, and seal it securely, without danger of getting the preparation on the surrounding tissue, which so frequently almost covers this class of teeth. The patient can assist the operator greatly in holding cottonoid to depress the tongue, and with everything in readiness the devitalizing

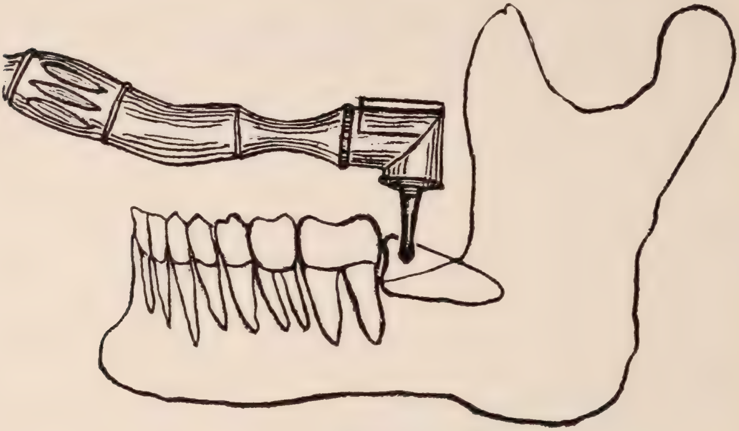


Fig. 2.

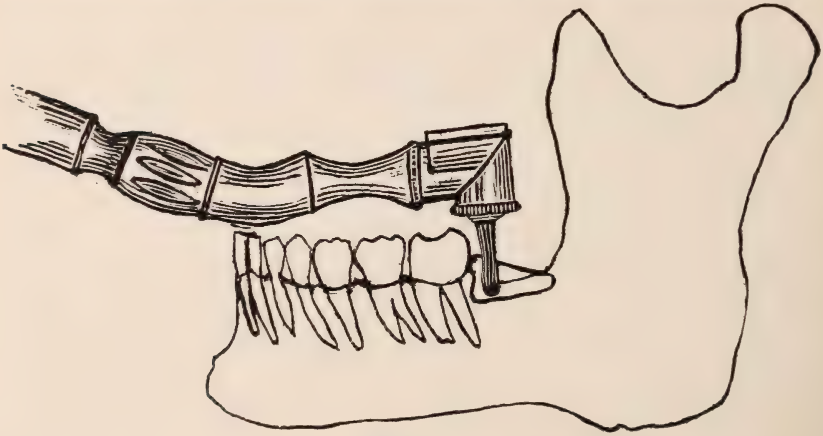


Fig. 3.

agent can be placed and sealed with cement. In five or six days the crown or a large part of it can be removed with burs. Instead of attempting to cut through the enamel at once the dentine is removed the width of the bur, so we have a groove extending entirely through the dentine, leaving only the buccal, lingual walls and what would be the mesial wall of enamel if tooth were in its proper position (Fig. 3). This much can be accomplished without the slightest pain. With sharp fissure burs the buccal and lingual enamel walls may now be cut (Fig. 4) and unless the burs are permitted to slip and plunge into the soft tissues the operation is not a severe one in any way. The fissure burs seem specially indicated for cutting the enamel walls on account of the long cutting surfaces and the power of the operator to control them. By placing one of these burs in the cavity or groove with the head of contra angle hand piece slightly inclined toward the cheek, the buccal enamel wall may be cut with little liability of the instrument slipping. In cutting the lingual wall the head of hand piece should be inclined toward the tongue. If it is impossible to completely separate the section of crown by this method of cutting, the remaining mesial wall can be broken by an elevator as soon as the patient is under an anesthetic. This portion of crown removed permits the moving forward and upward of remainder of tooth.

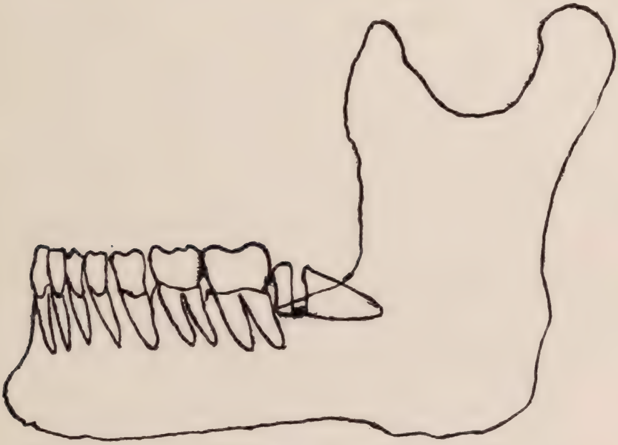


Fig. 4.

"WHAT WE LACK."*

BY DR. FREDERICK G. TAYLOR, NEENAH, WIS.

Mr. President—When I was approached by a member of your committee relative to my furnishing a paper for this meeting, my first impulse was to answer in the negative. In fact, I believe that I did at first decline the honor, feeling that I was unequal to the task assigned me, or rather, that I was not capable of writing anything that would be suitable or acceptable for this occasion, and knowing that silence is ofttimes golden and that one of small attainments frequently passes for better than he really is if he but cultivate a spirit of reserve, I was of the opinion that for my own particular welfare I would better not attempt a thing which at best could only meet with indifferent success. Your committee wished me to take the matter under consideration, however, and the result was that the more thought I gave to it and the more I strove to put it from me the more did I become aware of the danger of a man exposing his lack or inability by his silence just as plainly and as surely as by his words, and I began to fear that I might be placed in the same category with the "foolish son."

Perhaps you are familiar with the incident of the gentleman who had in his family a foolish son. The gentleman was about to make a brief business trip to the city and this son very much wished to accompany his father. The father had often promised that some time he would take the lad with him on one of these trips and so, after much coaxing upon the part of the boy, the father's consent was obtained. They made the usual preparation for the journey and the child received from his father an unwritten code of rules which should govern his conduct during their absence. The last thing the father said was: "And now, bub, I guess you'll get along all right and if you'll only keep your mouth shut, nobody'll know you are a fool." Well, they arrived in the city and things went on very well, indeed, with the lad until dinner time. At dinner they were seated at a table opposite two other gentlemen and during the meal the father entered into conversation with the strangers. Finally one of the gentlemen, turning to the boy, asked him a question. The boy looked his questioner straight in the eye—and said nothing. The stranger thinking the little fellow had not understood him, repeated his question a little louder than at first, and again the lad looked up—but kept silent; and the man turned to his companion and in an undertone said: "That boy must be a fool." The boy felt greatly depressed and sliding up close to his father, whispered: "Say, it didn't take him long to find out; did it, dad?" And so, gentlemen, this story which constantly came to my mind when I was striving to convince myself that it was policy for me to keep entirely in the background, is, in a way, responsible for my presence before you.

---

* Read before the Fox River Valley Dental Society, Neenah, Wis., March, 1906.

I have presumed that most of the papers presented here today would be distinctly dental papers and that something not so closely allied with our every-day work and yet something of vital importance to all of us, would not be altogether inappropriate and, therefore, the subject of the very brief paper which I have to offer you is not—strictly speaking—a dental subject. In other words, it is a subject that applies in a degree to all men, but more particularly, I verily believe, to men of our own profession than to men in many other callings of life.

What We Lack—We may not all agree, or be willing to admit, that the thing we lack—that the part in the average dentist's personality which is left uncultivated and undeveloped is—*Good, Sound Business Habits.* And by these words—business habits or business methods—I mean to embrace rightful economy from a financial standpoint, and also a foresight keen enough to stimulate one to provide something for the future, for the proverbial "rainy day" which is sure to come. Please do not misconstrue my meaning, gentlemen. This paper is not dealing, even in the remotest way, with dental fees—with the charges you make for your services, etc., for the amount of a man's income has little to do, after all, with the reserve he lays by each year. His income may be large, and yet he may not be able to keep out of debt and to keep his credit above suspicion, while on the other hand his income may be a very meager one and yet if he be systematic in his habits and if his desires are reasonable, he may have sufficient to provide for his wants each day and at the end of the year have the satisfaction of realizing that he is also moving forward.

I recall just here the pleasure I had in meeting a friend last summer down in my old boyhood home in southern Wisconsin. He is a day laborer and is now about 40 years of age. He has just completed building for his family a very neat and attractive little home. He stopped me as I was walking by his place and after conversing a few minutes together, I spoke of his home. "Yes, sir, Taylor," he said, "we think we have a pretty good home now and it's paid for. *It's paid for.*" That man's income was small—very small, and that beautiful spot called home meant—what? It meant economy. Now, it was that fellow's good, sound business methods that I admired more than anything else. He had lived in a comparatively humble way for years, that at some future time—he didn't know when—he might enjoy a home of his own.

But you say that this economy I am talking about can be carried too far, that it is the duty of every dentist to make liberal outlay, that he may give his patients the very best service that his skill is capable of giving them. Granted. You say that in order to do his best, he must spend his money freely for the purchase of the latest improved appliances; the very best materials of every description and must not think about economy along these lines. Very true. Such expenditures and along such lines are not the expenditures that need alarm us. It is along a different line entirely that I would make the plea for better business methods.

Some time ago a dental salesman came into my office, and after selecting the supplies of which I was in need, we talked together upon various subjects, but finally our conversation drifted back again to dental supplies and dentistry in general. I have forgotten which one of us opened the subject, but I said to him: "As a class, what kind of men do you find dentists to be, anyway?" "Oh," said he, "dentists are all right; they're good fellows." "Yes, I know they are good fellows, but what kind of men are they?" "Why," said he, "they are hail fellows, well met. I've always found them mighty pleasant fellows to meet." Well, I didn't get the answer I was after and I determined to make one more trial and so I asked: "How about them as business men? What kind of financiers do you find them? How do they pay their bills?" "Well, to be honest with you," he replied, "when it comes to finances, to paying bills, and that sort of thing—as a class—they are by no means faultless. They are visionary when it comes to money matters and they seem to be an easy mark for the 'confidence man.'

"I went into a dentist's office a few weeks ago," he said, "and the dentist met me in high spirits, and while he was selecting his supplies, he was telling me about an investment he had just made. It was no foolish investment, either, like so many are—this was the real thing. It was upon a business basis from the ground up and he didn't expect to keep at dentistry much longer. Just as soon as the thing got under good headway, he would be out of his office forever. After he had set aside the things he wanted, I made out his bill," said the salesman, "and when I handed it to him, he said: 'Say, old man, just book that for a while, will you? I'm hard up for cash just now. I've been going a little beyond my means lately, but I'll try and square with you, if I can, the next time you come around.'"

Well, gentlemen, I don't know how that thing impresses you. Perhaps it may not appeal to you in just the way it appeals to me, but this stepping just over the border line, this habit of going just a little beyond our means, is one of the things that, in my judgment, a man should abhor. It is the seed which, if sown, will some day bring forth a harvest of remorse, and I can conceive of but few things more unpleasant for a man after a whole life of service, than to be compelled to look back over the past with that feeling of remorse. Remorse, because of opportunities that had once been his, but that were his no longer.

In rebuking an intimate dentist friend of mine for his laxness along these lines, I have often been met with this reply: "Oh, what's the difference? It comes easy." Well, let us grant that it comes easy—(although after a considerable number of years of service, I must confess that such an experience has never been mine)—but grant that it does come easy. Will it always do so? Will those fingers which manipulate the delicate dental instruments with such ease and dexterity, always be able to do it? Do we forget that of the various callings open to a man, we have selected one of the most unhealthful? Do we forget that if we are busy men, our days of usefulness are fewer than the days of most other men, and that we owe it to ourselves and to our own to look somewhat to the future? We shall all find enough other things to annoy us without having to worry over unpaid bills that are overdue and our sleep will be the sweeter if we keep out of needless debt, and if we imitate the *Village Blacksmith* who could "look the whole world in the face, for he owed not any man."

I should like to close this paper by using a quotation which most of you have, perhaps, seen before. It is a partial quotation taken from the cover—from the last, but by no means the least important page of the *Dental Cosmos*.

"There is a time in every life, however smooth and even may be its usual tenor, when a crisis comes. An opportunity occurs not likely to be again offered; a glimpse of something better or higher is afforded and the whole future course of life may be influenced by the choice we then make and the path we then select. Perhaps no regrets are keener, no disappointments harder to bear, than those which follow mistaken choices. 'I held the opportunity in my hand and threw it away' or 'I waited too long and lost my chance' or 'a little more thought or a little more self-control would have saved me these sore troubles,' are expressions commonly heard, and they certainly add greatly to the sting of frustrated plans or fallen hopes. If we would meet the crises of life worthily, we must prepare for them before they come, and they will not take us unawares. Whatever of such preparation we lack—that let us with all ardor cultivate. Continual steady exercise will turn a weak muscle into a strong one and the same is true of every faculty we possess."

PRESIDENT'S ADDRESS.*

BY J. J. WRIGHT, D. D. S., MILWAUKEE, WIS.

This is the twelfth meeting of the Southern Wisconsin Dental Society, but it is first time that the dentists of Milwaukee have had the pleasure of extending to you their hospitality. We hope that your stay in this city may be one of pleasure and profit to all.

In these days of rapid progress a gathering like this is an educational stimulus which none can afford to miss. The interchange of ideas and methods of work must create in each one an ambition for improvement obtainable in no other way.

---

* Read before the Southern Wisconsin Dental Society.

Never since necessity required the services of a dentist has the public been so well served as at this time. Never have people followed the advance of a profession so closely. Always willing to pay for the best that can be produced, eagerly waiting for the esthetic, ever tolerant of our failures and ever grateful for our successes.

With such a people to encourage a body of earnest workers who, if they are not all original and ingenious in their methods, are at least close followers of every improvement, is it any wonder that dentistry in the United States has developed with such rapid strides?

There are about as many dentists practicing in this State today as comprised the entire profession in the United States in 1845, and nearly as many in Milwaukee County as there were in the whole State in 1885.

It is of interest to note that in 1885 there were practicing in this State 345 dentists. In Milwaukee County 48, 17 of whom are still engaged in active practice in this city. Thus we see that the burden of the day is being borne by a new generation, and before this old guard shall have passed entirely from our ranks, it is fitting that we pay tribute to these staunch pioneers.

Their stability of character, their fidelity to duty and high ideals, have set an example which may well be emulated by all who follow in their footsteps. To those whose high attainments have left us this heritage, we tender our grateful acknowledgment. May their remaining years be years of health and prosperity.

Gradually the old methods of work are giving place to the new, with vastly greater benefit to both patient and operator. Orthodontia has been so simplified and improved in respect to appliances as to place this class of work easily within the possibilities of every practitioner who cares to make a study of it and limit himself to the moderate cases. The complicated appliances of a few years ago have given place to those more easily adjusted. In prosthetic dentistry the improved and accurate methods of swedging metal plates has produced a revolution in this work. In operative dentistry the simple method of inserting a gold inlay has replaced the arduous task of putting in large contour gold fillings, not only saving many teeth which must otherwise be crowned, but in economy of health and time for both operator and patient, is of the utmost value.

Still one step in advance of all these is the possibility of accomplishing work in the anterior teeth without disfiguring them. The method of inserting porcelain inlays has by no means reached perfection, but imperfect as it is, it is rendering service in an esthetic and practical way which is winning the commendation of those who have been most hostile to it.

To enumerate the progress that has been made in every branch of dentistry would be but to repeat well known facts. With all this advance there remains much to accomplish. The ideal filling has not yet been discovered; the treatment of pyorrhea has not been presented in such form as to be successful in the hands of the average practitioner. A safe obtundant for sensitive dentine, which will prove proficient in all cases, has not yet been produced. Nor has the dentist been able to expedite his work so as to afford him the necessary time for more out-door life.

It would seem that all of these problems might be solved in our day and generation.

The literature of the times affords the entire profession an opportunity to advance step by step with each new theory brought forth and discovery made. Men are vieing with each other to put into print ideas that will not only be of help, but will add to the history of our development.

We find in our ranks many men well equipped for original research—which is leading to the solution of many abstract problems. Yet a method for the prevention of caries has not been found, and not until it is found can we hope for the ideal. This ideal, in part at least, must be brought about by means of prophylaxis—and this important fact is just beginning to be made manifest.

From the number of dental societies and the general activity and alertness within our own border, we find that our dentists are living up to the motto inscribed on the shield of our own Wisconsin—Forward!

PROCEEDINGS OF SOCIETIES.

THE ODONTOLOGICAL SOCIETY OF CHICAGO.

A regular meeting was held March 13, 1906, with the president, Dr. J. E. Hinkins, in the chair.

Dr. A. W. Harlan, of New York, read a paper on "Copper Sterilization; Its Application to Dental Instruments, etc."

DISCUSSION.

DR. TRUMAN W. BROPHY:

I am sure it is a great pleasure to us all to have Dr. Harlan with us tonight. We have all enjoyed the paper very much.

The topic of his paper, the sterilization of instruments, is one that has been very much neglected by the members of the dental profession. Nobody can tell how much harm has come from the use of unsterilized dental instruments. In the work I am engaged in I know that infections have been carried by means of unclean instruments to the mouths of innocent people, and therefore I am glad that this subject has been brought before us this evening, in order that we may again impress it upon others, and take home to ourselves the importance of perfect sterilization.

A gentleman of my acquaintance one day remarked that he had used a broach that was sterilized. He passed it into the infectious canal of a tooth; he passed it into another canal in which part of the pulp was still alive, and it caused trouble. I remarked that he should have used a sterilized broach in each canal, and then he would not have had this trouble. That thought never occurred to him; so you can readily see what little things cause trouble.

The plan Dr. Harlan has demonstrated, making use of what is practically a simple device, which can be controlled by the use of the Edison current to sterilize instruments, and do it in a way so as not to destroy their texture or impair the value of steel instruments, is really most efficient and convenient. It is true, the ordinary way of sterilization of instruments by means of boiling them in water, in bicarbonate of soda, or some other agent, is awkward. It is not as convenient as this one. It seems to me we could make use of this plan and sterilize our instruments, or have them sterilized by our assistants, and have them always ready for use.

The chemical reactions and chemical agents that are employed in the sterilization of the roots of teeth will in the future, as in the past, be questions for debate. Probably there will be no one agent that will be generally employed. Chemists have advised different agents, and they will be employed, but we must have in our profession something which more approaches a system, and I believe that this simple plan of sterilization will bring us more nearly to a systematic way of sterilizing our instruments and getting them in a condition so that nobody can raise the question or cast suspicion upon the dentists for using instruments that are not absolutely clean.

Dr. C. N. Johnson:

Dr. Harlan and Gentlemen.—It is a great pleasure to have Dr. Harlan with us once more, and especially since he has brought us something that is instructive and entertaining. I feel that it is difficult for me to follow some of the details of the paper, and I am going to ask Dr. Harlan a few questions.

After the assistant has scrubbed the instruments mechanically with soap, etc., as I understand it, this solution is kept hot and the instruments are simply placed in it. It that the idea?

Dr. Harlan:

The dry sodium carbonate is added to the water, because this is simply sterile water. It is not water that would disinfect. It is dry carbonate of sodium; but you get sterile water to begin with, and if you use bicarbonate of soda in unsterilized water, it will be all used up before you get it to the instruments.

Dr. Johnson:

Would you think it possible that if in case the assistant in scrubbing the instruments should unfortunately leave some infected matter on them, that the infection would be thoroughly controlled by the solution?

Dr. Harlan:

That question might be answered in this way. It would be just the same as it would be if one used formalin, bichloride of mercury, or anything else; if the infectious matter did not penetrate and reach the interior, it would sterilize it.

Dr. Johnson:

Would you consider this solution as perfect a sterilizer as bichloride of mercury or carbolic acid?

Dr. Harlan:

I do.

Dr. Johnson:

Let me ask you one other question. We find in examining this coil that the color has changed materially from the time it was placed in the solution. I would like to ask whether it is a preciptate from the water, or is it due to something that is taken from the copper?

DR. HARLAN:

The collodial copper has been dissolved by the water. It has to be polished again before used. If I employed a larger vessel, or if I wanted more water, I could get half a gallon, three quarts or a gallon, keeping it in the vessel a sufficient length of time to boil it. If you put Chicago water or St. Louis water in one of these polished copper vessels, after it has stood three hours and a half, it has to be repolished, and it takes but a short time to do that.

DR. JOHNSON:

How do you polish this coil?

DR. HARLAN:

With metal polish.

DR. JOHNSON:

It appears to me that this is a very simple method for sterilizing instruments, and I want to express my personal appreciation for the excellent ideas that Dr. Harlan has brought to us tonight. I am sure they will prove very practical, and that this method is very efficient for the sterilization of instruments in the dental office. I believe he has given us a solution which we may use for syringing pockets and putting the mouth in a hygienic condition before operations. The paper has been very instructive to me; I have enjoyed it very much, and I am sure we will get more out of it when we study it in print.

DR. J. G. REID:

Mr. President and Our Honored Guest.—I feel very grateful to be present on this occasion for two reasons: First, I am satisfied in my own mind that I have learned something, and, second, I am glad to see Dr. Harlan here.

I am not prepared to discuss this paper as I would like to. I was hardly able to follow all that was said because of the rapidity with which the paper was read, but when it is published, it will be a paper that we can very nicely sit down and read and think about, and get the meat out of it.

The simplicity of obtaining sterilized water by this means is to me unique. It is easy, and I am sure we have all been more or less hampered in our attempt to use sterilized water. How difficult it is sometimes to have it at hand, but how easy it is by this process to have it constantly present in a very quick way, and at a nominal expense. It is not only useful for the purpose that has been presented in the paper, but it becomes useful as a medium for drinking purposes, which we all realize we need. We can have quantities of it on hand at a very low cost. I believe there is no one who realizes the importance of the sterilization of instruments more than I do, and Dr. Brophy has aptly mentioned the fact of very bad results that can accrue from unsterilized instruments, and how easy it is to communicate poison to innocent tissues by carelessness in the use of unsterilized instruments.

I have for years never used anything but lysol preparations for sterilizing instruments, believing that it was a reliable disinfectant, and I have always pinned my faith to that agent for that purpose. I believe I have been reasonably safe in its use. The simplicity of the method outlined by Dr. Harlan appears to me as being a great step in advance.

I am not able to say anything further at this time. Dr. Johnson took up some of the points I had in mind in his interrogatories.

Dr. L. S. Tenney:

I can not discuss the chemical features of this paper. I think I feel with all the members of the society that we have a great void in our midst, filled here tonight by having Dr. Harlan with us. I remember very well the instruction I received from Dr. Harlan in my college days. I was impressed with his striking personality and his work. He made such an impression upon me that ever since those days I have been very glad to act upon his advice and follow in the ways he has pointed out to us.

There is no subject in dentistry that is more neglected than the one of sterilization of instruments. I wonder how many dentists disinfect their instruments once in twenty-four hours, and how very few there are who have used instruments that are surgically clean after each operation. I venture to say almost none, and it is due perhaps not so much to negligence, but more possibly to the fact that we lack suitable and convenient agents for that work. Therefore, it seems to me that anything which is so easily obtained as this, and can accomplish the work in the way Dr. Harlan has pointed out, and is so readily prepared, will certainly be of great assistance to us in our every-day practice.

I wish I might discuss the subject from the standpoint of the chemist, but I can not do that. I can only discuss it from the standpoint of an every-day practitioner of dentistry, and I join with the members of the society in welcoming Dr. Harlan here, and feel that it has been one of the greatest pleasures of the year to have him with us once more.

Dr. George W. Cook:

Dr. Harlan has always been suggestive, and personally I have a great deal to thank him for. It has been said, I believe, that a man who can always give you suggestions is one who will do you more good than he who gives you facts that you are not able to work out. If you get suggestions, you may be able to work out a problem in your own way, and accomplish more than if you rely solely on facts, and misinterpret facts in a way that you can not utilize for yourselves or give them to others. He always gives us a suggestion. These suggestions have been utilized by the dental profession as much as those that have emanated from any man in our section of the country, and I want to thank him personally, not only for this, but many other suggestions that he has given us in his work, and for his efforts to teach higher and better methods and means of treating and handling the oral cavity.

Dr. Harlan has kept me at work very industriously for about fifteen years. The subject he has brought to us is one that is full of suggestions, particularly with regard to the sterilization of instruments.

With reference to his remarks concerning the polished surfaces of copper, I think away back in 1415 there were a number of observations made upon the actions of metals by water running over them, or by allowing the water to run over the polished surface of any metal, and consequently the surface action of metals has been one that has been productive of scientific investigation for a great many years. I do not recall now the author who first observed that if he took water containing alagæ and placed it in a large copper vessel all the algæ appeared in the center of that vessel; that they got away, as it were, from the surface, and the higher the polish of the copper was, the more quickly would they concentrate themselves in the center of that vessel, but immediately upon applying heat to the outside of the vessel, the algæ disappeared from the center and appeared on the surface of the metal, and the water then could be easily poured off and the algæ would remain on the surface. That is what some have called the surface actions of metal with reference to living organisms. What takes place probably in the copper here is simply a corroboration of the observations that were made many years ago, but which were not known. All the organic material in that water appears on the surface of the copper, and when the copper is removed, it contains a large number of organisms or organic material that was in the water, and therefore freeing the water practically from the micro-organisms.

As to the necessity of sterile water, I do not think dentists use it as often as they should. I do not believe they use instruments that are surgically clean or sterile. We know by experiments that with many of the agents we look upon as antiseptics, it takes days in many instances to destroy the micro-organisms. Most of the contents of the water as it comes from the hydrant does not contain so many bacteria themselves, but contains the spores, and it is the spore development which is the thing we have to rid the water of in many instances, and if these spores are introduced into the mouth, ordinarily they find there the proper conditions for development. They develop immediately into active organisms, or what is supposed to be the vegetative stage, in which they grow and multiply very rapidly. The action of copper is most efficient. This can be produced by platinum and gold very easily. This platinum probably is next to copper in this particular, but owing to the expense of platinum, it could not, of course, be used. Copper furnishes the same conditions that does platinum, and is more accessible, and can be utilized under most circumstances much easier than can platinum.

After visiting Dr. Harlan's office and hearing him talk, I thought a good deal about what he has presented to us tonight. I saw the coil that he has; I saw his copper vessels, and I think he has utilized here the great advantage of some well-known things—I say well known, inasmuch as a great many scientific workers have thought of this and have found it necessary to utilize it in some particular instances. There is a universal agitation going on now with the health departments of various cities and States in regard to how they can construct copper vessels and utilize this or a similar method and procure the same results without depriving the water of the gases or the organic material that is in the water, and at the same time deprive it of living organisms that are present, which are, of course, the things we want to get rid of.

Before I sit down, I want to thank Dr. Harlan not only for being present, but for the excellent suggestions he has given the dental profession from time to time, and for the interest he has always shown toward me as a timid young man. I am glad he is here, and I am sorry he is not with us more often.

Dr. Elliott R. Carpenter:

We are all gratified to have Dr. Harlan with us this evening, and to have had the pleasure of listening to his excellent and scholarly paper.

As to a chemical analysis of the paper, I think it is too much for any one at one reading to touch intelligently on it, and I shall not attempt to do so. But as one of the previous speakers has said, he always brings to us suggestions. This paper contains many excellent suggestions on the subject of sterilization. Not only suggestions of what to do, but what not to do. Disinfection and its importance as applied to dental instruments, he has given us a splendid exposition of. A year ago last February a gentleman came to my office whom I had known for two or three years, with a very serious and carious infection of the superior maxilla. He was a club man, and he had been to a club dentist. He was sent to Dr. Brophy, and Dr. Brophy was out of town, and I did what I could for him for a little while, and referred him back to Dr. Brophy. The gentleman went to Dr. Brophy's office again, and he was still out of town. He came back to me and said he felt better, and was anxious for me to go on with the line of treatment which I had given him. I then questioned him as to the cause of his infection, and he told me that he and another club man had been to the club dentist on the same afternoon, and that both received the same kind of infection. It is very fair to presume from the slovenly methods described to me by this gentleman on the part of that dentist that his instruments had never been sterilized, and I have been trembling in my boots for a whole year as to whether I personally sterilize my instruments properly or not.

I have not had much faith in a great many of the so-called sterilizing agents, and I have had a good deal of faith in boiling water for surgical cleanliness, and it has been my habit in sending my instruments to the laboratory to have them thoroughly scrubbed and cleaned first, and then put in a cooker and boiled for fifteen minutes, and then taken out and wiped with a sterile napkin.

Another suggestion that has been brought to our minds by the paper is the ability of copper as a sterilizer. Dr. Harlan has spoken of cooking utensils that have been in use for years by celebrated French chefs. They have been unconsciously sterilizing their utensils. A few years ago, when Dr. Ames brought out his oxyphosphate of copper, I used it rather extensively in the mouths of children, and I found in a great many cases where it was used at or below the gum line, where the gum itself had become hypertrophied, by working over the ragged edge of a cavity, when the cavity was filled with oxyphosphate of copper the gum became healthy and hard, and pink in color. It always does that. The surface of this filling material when brought in contact with moisture throws down a salt of copper.

About a year of two after my first experiments with oxyphosphate of copper I had occasion to remove three or four oxyphosphate of copper fillings that I had placed over tissue that was carious. In other words, the tissue in the cavities was deep-seated, and I felt that I could not remove all of it without encroaching upon the pulp. I did it as an experiment, to see whether it was sufficiently irritating to devitalize that pulp. However, it did not do it, and upon removing that I found discoloration of the carious tissue. I kept a clinical record of the case, and my clinical experience demonstrates that copper has a great field, and I am more than glad to know that it can be brought in contact with water and cause the latter to become sterile. I thank Dr. Harlan very much for the suggestions.

Dr. L. L. Davis:

Twenty-two years ago this month it was my great pleasure to meet Dr. Harlan in the city of Detroit for the first time, within two or three days after my graduation, and at that meeting I have clear ideas as to what his first talk was about that I had the pleasure of listening to. It was on the treatment of pyorrhea, and the disinfection of pockets. I have never yet heard Dr. Harlan get up and read a paper without referring more or less to disinfection and disinfectants. It seems to me that his whole life-work has been along the line of disinfection. He has preached more on this one subject than any other man in the dental profession I have ever heard. Tonight we have received another sugestion from him. While some of the preceding speakers have said that it is not a new suggestion, yet it has been brought before us in such a way that we may consider it new. He has presented the matter in a simple way, and it is something that ought to be in the office of every dentist; and while I am not able to discuss the chemical formulæ that he has laid down, or to take any issue with him, I can acquiesce in much of what he has said. I do not think he would give formulæ without being pretty sure that he was right. When Dr. Harlan says "it is so," he usually is right. I shall procure one of these little appliances just as soon as I can get it, and I shall try to get all the points I can from Dr. Harlan, so as to get one as soon as possible.

Speaking of sterilization of instruments, I have relied solely on medicaments and boiling water for the purpose of cleansing my instruments. I do not know that I can say anything that has not already been said by some of the other members in regard to our appreciation of the work of Dr. Harlan. He knows how I feel toward him, and I thank him for what he has done and for what he is still doing, and trust that he may keep on doing this work for a long time to come.

Dr. W. V.-B. Ames:

The subject that Dr. Harlan has brought before us appeals to me from the standpoint of the effect of metals upon water. A paper which I read before this society not long since was on sterilization of water and other commodities by the peculiar something which develops or is present upon the surface of some metals, mentioning among them copper. The question of sterilization of water is something that communities and people at large have very much needed to get wise upon. From experience I have had I have become satisfied that water as ordinarily distilled is not apt to be as sterile and useful an agent as water which has been boiled and filtered. I had an experience with a company, of this city, furnishing so-called pure ice and distilled water in sealed bottles, which often had an odor and a perceptible taste, and on writing to this company, as I was using considerable quantities of it for chemical purposes, I was informed that the water was all right, and that if there was any such trouble as I mentioned it was through my own carelessness. I was satisfied that that was not the case, and I put in a distilling apparatus. I found it was very easy in running a distilling apparatus in a way to get the most from a given amount of fuel, condensing the greatest amount of water from a given amount of fuel, to have the difficulty I experienced in buying water from the company mentioned. There is often a certain odor from water drawn from the tap which you can have with distilled water if condensed in a certain way. If you bring distilled water from the orifice of a coil in which the water is condensed, cold, you will have what I would call the mephitic gases of the tap water, which have been condensed with the steam, giving the water this taste and flavor. You can bring water from the condensing coil nearly boiling (scalding hot), and some steam, when you have a pure tasting water without flavor or odor, and I believe really in that case a sterile and sterilizing water. We know that where the steam has been condensed and collected as cold water, you have gotten rid of the salts of inorganic nature, but that you have, to an extent, volatilized some of the organic matter and recondensed it, and you have not what you really ought to have in getting sterile water; so that this process which Dr. Harlan advocates enables us to have better water for the purpose than a carelessly distilled water.

Dr. Harlan says that there is not a satisfactory definition of colloidal metal. The peculiar action, as I tried to look into it a few years ago, was not satisfactorily explained.

I have seen the results of inserting copper wires within root canals and within the tract of a fistula. I used to place copper wires deliberately in a fistulous tract to see what would happen. You know what happens when you take copper wire from a root canal. That copper is black. It has not acted as a permanent sterilizer or destroyer of germs in the canal, because of what happens, and that is just what has happened to this coil—it changes color, and there is the formation of something upon the surface of the copper which, in a short time, heads off any further action. I have taken a little trouble to try to satisfy myself as to what this might be in the case of copper, and while it seems as if I had come to a reasonable conclusion as to what it might be with copper, it does not so satisfactorily explain the action which might come from the use of other metals than copper, such as silver, and if there is such colloidal action with platinum and gold, I can not reconcile the theory in the case of those metals. But with copper there is something which I have not seen or known of having been brought out theoretically, and that is that in ordinary metallic copper there is in solution, or there is dissolved in the metal, invariably, a certain amount of cuprous oxide. There is in commerce a distinction between what is called dry copper and ductile copper. The dry copper contains a large proportion of cuprous oxide in solution in the metal. Ductile copper, or so-called chemically pure copper, undoubtedly contains a decided trace of cuprous oxide in solution in the metal. It has intermixed itself all through that apparently pure copper. A piece of copper may be practically chemically pure, and yet it has within its mass a percentage of the red oxide of copper. This may be the explanation of the action of copper upon water, because the oxide of copper in the presence of organic matter or ammoniacal solutions would be dissolved, and Dr. Harlan says in his paper that it takes one part, I believe, in 8,000,000 to have an effect. You can see that the least trace of this oxide of copper being soluble in what would naturally be present in putrescent matter would furnish this trace, and the fact that the surface of the copper becomes discolored and needs freshening, might indicate that this is just what furnishes the active agent. You have a change upon the surface, and you need to scrub it to remove the slight layer of what is deposited there, freshen up the surface of the copper, exposing a certain amount of this red oxide again to the action of the agent we are trying to get rid of.

I would like to have Dr. Harlan tell us whether this has ever been considered in relation to the potency of copper for this purpose.

DR. J. W. WASSALL:

I am very happy to join in the hymn of praise to Dr. Harlan for what he has done for us all personally, for the profession, and for humanity.

There is no doubt in our minds that what dental offices need more than anything else is a system for the disinfection of instruments. We can look at our own offices and see the need of it. We can look at our neighbors' offices and see the necessity of it, which proves that it is a difficult matter to accomplish. It will mean very close attention to details to accomplish anything like approximate asepsis in the practice of dentistry. If we go into some offices we see some show of disinfecting apparatus, but it has always been a grave question in my mind as to how much is accomplished by these means. However, it is in the right direction. The very fact that dentists have these things in their offices is hopeful.

The little apparatus Dr. Harlan has shown us tonight is very suggestive and useful. He has made the first practical application of the property that copper has for sterilizing water to dentistry. This apparatus is portable; it is convenient and inexpensive, and I hope it will help a good many men to get farther toward that goal.

In my own office I use sterile water in the operating room, both for the use of patients and for cleaning instruments. I have a five-gallon copper urn, such as is made for hotels and restaurants, which is connected to the hot water side of the water system in the building, and interposed between reservoir and the hot water pipe is a stone filter. Every morning this is filled with hot water from the building, and I have found from the management of the building that the water which is furnished on the hot water side of our water systems in high buildings has been superheated. It has not only been thoroughly boiled for thirty minutes, but it has been superheated. It is therefore pretty well sterilized, and if it is filtered afterward and carried into the tank, where it is kept warm (and I have a thermometer on the outside of the tank to regulate the temperature), it gives me an abundance of sterilized water.

Dr. J. E. Hinkins:

Personally, I feel very grateful to Dr. Harlan for presenting such an excellent paper and one that is fertile with suggestions. I have done some work along chemical lines, but I have done nothing along the line of colloidal copper, and when I was in New York Dr. Harlan showed me his devices. I became interested in it and since I have returned home I thought I would read up on this subject, but I found the literature I wanted to get hold of in the short space of time I had was too much for me to read to get any information on this subject, or to give me an idea of what his paper would be when he came to Chicago.

In reading his paper he spoke of using dried sodium carbonate. Did you mean $Na_2 CO_3$, or $NaH CO_3$? What is the object of having it dry?

Dr. Harlan:

It is the regular standard preparation of chemically pure dried sodium carbonate, $Na_2 CO_3$.

Dr. Hinkins:

What is the object of using that with distilled water?

Dr. Harlan:

It is not distilled, it is sterilized water.

Dr. Hinkins:

Perhaps the object of using it is more for its solubility or for the affinity the sodium carbonate would have in that solution of breaking up and combining with other organic matter. It would combine with it and break it up into another medium and help cleanse instruments, and probably it is used more on that account than from the standpoint of a disinfectant.

Dr. Harlan:

The instruments are supposed to be clean, but not sterile, but when put into the solution and allowed to remain five minutes they are supposed to be sterile, and I will tell you how I determined that. My assistant had a wen on the second joint of his left index finger, so we took that solution, scraped his finger, etc., and the instrument that was used in cutting it out was scrubbed in that and then the wen cut out. Then it was dressed with this and lint placed over it, and it was sealed, and healing took place without suppuration. We concluded that was practically proof of the power of its disinfectant property. He was willing to undertake this experiment and I was willing to assume the responsibility of treating him for septicemia, if it should develop. But he got well.

Dr. Hinkins:

You use the soda as an adjunct in sterilization?

Dr. Harlan:

I use carbonate of sodium as a disinfectant in sterilized water, but the water will not destroy the pus-producing organisms, because it is not a disinfectant.

Dr. Hinkins:

I did not understand whether you used it for that purpose, or used it for the chemical action which you got on anything that might collect on the instrument.

Dr. Harlan:

You can use formalin or anything else.

Dr. Hinkins:

The point I had in mind was this, namely, if the water is sterile and there are no disinfectant properties about the soda, what is the object of having water to disinfect instruments?

Dr. Harlan:

Carbonate of soda is a disinfectant.

Dr. Hinkins:

It is very limited, though. The next point I had in mind was that there is hydrolysis from the organic matter on that coil. Do I understand that the electric current is connected with the coil, or does it heat the copper coil?

Dr. Harlan:

This current heats this coil and in doing so it renders it sterile in a quicker manner when it comes in contact with dissolved colloidal copper or whatever it may be, cuprous oxide or anything else. But it is supposed that it is the colloidal copper which is dissolved by the water, and we not only get boiling water, but the substance that is taken from this is communicated to the water, which sterilizes and precipitates the albuminoid elements and ammoniacal elements of the water, and at the same time it drives off the mephitic gases that Dr. Ames spoke of, as being stored in the imperfectly distilled water. That is why we get a smell or odor. It is not driven off. It is condensed; it is dissolved in the water that is supposed to have been distilled. This apparatus is attached to a regular current, and you put a bulb on here (indicating) to show it is going when it is operating, and it is a safe course to use, so that you will not burn your fingers, and at the same time it prevents too great a flow of current into the coil. You produce heat in the same manner that you do with an oven, only it is not a white heat.

Dr. Carpenter:

Does the electric current pass through the water?

Dr. Harlan:

The electric current does not go into the water. It does not affect the water.

Dr. Hinkins:

With reference to colloidal copper I would like to ask Dr. Harlan if there have been any experiments made, or is there any literature to show that there is any vibratory action or radiation which may come from the heat of that coil that helps to heat the water? Has there been any work done upon that?

Dr. Harlan:

In my article, published in *Items of Interest* (Dec., '05), I referred to the experiments of Pennington, Gildersleeve, Stewart and quite a number of others who had written in the *American Journal of the Medical Sciences,* and in other journals, detailing their experiments with regard to colloidal copper. You will find in footnotes of my paper the sources from which some of my information has been taken. The experiments of those gentlemen were conducted with reference to sterilizing the water in lakes, parks, rivers, etc., and an army surgeon who presented a paper before the American Medical Association at its last meeting at Portland, spoke of it for the purpose of destroying the bacillus of typhoid, etc. The subject is so vast and so much has been written about it comparatively recently that it was impossible for me to go into details or to give all of their statistics.

Dr. Hinkins:

The reason I have asked you these questions is because when I tried to read up on the subject I found that I could not do so intelligently because of the large amount of literature on it. I wondered if anything had been written to show whether there was radiation of the heat to the coils, or whether it is the solubility of the cuprous oxide from which we get the sterilizing properties.

Dr. Harlan's paper is very instructive, and it opens up a field for a great deal of work and a great deal of thought. I would like to ask Dr. Harlan if this device can be used with either the alternating or direct current?

Dr. Harlan:

It is suitable for both. Mine is a direct current.

Dr. J. H. Woolley:

Dr. Harlan's paper has been quite a revelation to me. For a number of years in sterilizing a tooth my last procedure before filling the root has been to use a heated broach.

Dr. Harlan's remarks on the sterilization of water were very suggestive and explain somewhat the effect of heat upon moisture in the dentinal tubuli, and also why sterilization with the use of antiseptics may have proved a failure, although the root may have been filled to its apex. If heat has not been used in a root before filling, if the dentinal tubuli have within their compass the possibility of septic matter, just by simply drying it with cotton, even though the end of the root is filled, there is often trouble in the peridental membrane, so that the use of copper, when brought in contact with the root canal, is the solution of what I have been trying to get at for a long time in regard to sterilization.

Dr. George W. Cook:

There seems to be some confusion as to what takes place, and perhaps Dr. Harlan, if I could touch directly on the point, might give some explanation, and that is, it is the surface action of the copper on the water directly. That is the point he tried to bring out. It is the surface action of the copper on the water, and in order that we may get that action that surface must be polished absolutely, and the water does not have to be boiled either.

Dr. Truman W. Brophy:

Supposing a dentist was located where electricity was not available, would not a copper kettle serve the purpose quite as well?

Dr. Harlan:

Yes; only he would have to expose the water for a longer period.

Dr. Brophy:

It strikes me that in the conclusions of Dr. Harlan's paper that fact should be stated, because some dentists may not have electricity in their offices.

Dr. Harlan (closing the discussion):

I am deeply indebted to you for your kind remarks, and I am pleased to be with you.

I wish to say that there are very few things that are the absolute discovery of any one man, because so many things done by other people have percolated through, and ideas have been picked up here and there, put together, and then reported as great discoveries. I have not made any discovery at all. There is not a particle of originality about this, so far as I know. I do know, however, that after becoming interested in this subject I tried to make a practical application of it so that it would be made useful to dentists. My first efforts were with reference to the use of a copper boiler or a spun copper pot. I do not know exactly what it is on the surface of the polished copper that makes it so useful in depriving water of the organic matter. If you look into the dictionaries, including Brant's and other dictionaries of the arts, you can not find a good definition of colloidal, although it is a term that has been used for many years, and as Dr. Ames said, this might be in silver. There is what is known as colloidal silver, and one of the speakers before the American Association for the Advancement of Science, at its last meeting, held in Boston in September, said that he had obtained better results with colloidal zinc and colloidal silver than he had from colloidal copper. It is absolutely certain that if we expose hydrant water as it comes from anywhere to a polished copper surface, that in three and one-half hours or four hours you can almost see with the naked eye if there is any contamination or any considerable quantity of organic matter. You can see the precipitation of the water to the bottom. The algæ, which have been referred to by Dr. Cook, make a bee-line for the center of the water as soon as they feel the vibratory motion referred to by Dr. Hinkins, when brought in contact with a polished copper surface. Now, it stands to reason that you must either decant this water off without disturbance of the precipitation, or you must filter it. I think the best way is to filter it, and I run it through a stone filter, which is cleaned daily, and then after that is filtered I preserve that kind of water. I am not talking about water that is heated, but that which is retained in the copper pot.

After looking over the various heating apparatus of the Edison Company and those of several other companies who had electrical exhibits in the Madison Square Garden a few months ago, I came to the conclusion that the best thing was a copper coil gotten up solely for the purpose of heating water. They nickel plate it, and that destroys it, so far as its ability to sterilize water is concerned. I said (and therein is where I am entitled to some credit), if you make this without being nickel plated, we can use it for sterilizing water. Well, it took them two or three weeks before they could get that done, because they turned out these things by the hundred for heating water in hospitals and dispensaries, for heating milk for babies and invalids, so that so far as I know this is the first one that has been purchased in New York, and we immediately commenced to use it. We have used this copper sterilizer for everything for months and we have not had any case of infection. If you get it into your minds clearly that this is simply for the purification of water, and that only to get rid of the bacterial elements and the deleterious gaseous elements, and still leave the inorganic constituents that are necessary, and that are palatable, it will make you feel as though you are drinking something that has a good taste. I do not think it is a good thing for children to drink water that has been deprived of its inorganic salts, but it is a necessity, to avoid infection, to use water that is pure.

THE FORTY-SECOND ANNUAL MEETING OF THE ILLINOIS STATE DENTAL SOCIETY, SPRINGFIELD, MAY 8, 9, 10, 11, 1906.

DISCUSSION OF DR. WALTZ'S PAPER, "CONCERNING THE PORCELAIN INLAY."

Dr. W. H. Taggart, of Chicago:

Mr. President, Ladies and Gentlemen: It gave me a great deal of pleasure to listen to the essayist, and instead of taking up parts of this paper and analyzing them, what little I have to say will be chiefly in other directions, and more for the purpose of encouraging you in the use of this material and explaining some of the underlying principles of construction.

The average piece of porcelain is over-baked. I would also consider the filling had lost from one-half to two-thirds of its strength if my first bake was a glaze. All it ought to have is to be brought up to a sandy appearance, making it look as if it had been dipped in hydrofluoric acid. We have found that the temperature to which a piece of porcelain is subject in the furnace is not the only element that changes it, but the length of time it is subjected to the baking temperature is important also. Say that a temperature of one thousand degrees would be necessary to biscuit a certain piece of porcelain and would do it, say, in five minutes. If another piece of porcelain similarly formed was to be put into the furnace and baked at 800 degrees for a much longer time, you would get the same results, but at a temperature of 200 degrees less. It shows if the first portion is under-baked (biscuited), it will be completed at subsequent bakings, while if glazed at first baking, that portion will be much over-baked before the inlay or crown is finished. If you will remember this, you will get very much stronger porcelain.

A year ago or two years ago Dr. Poundstone and one or two other gentlemen got to theorizing about the ultimate thickness of the grains of cement when they were mixed and put into the cavity, stating that there would be no necessity of having a matrix thinner than 1-1000th inch, for the reason that grains of cement could not be condensed into smaller spaces than that thickness. I found that in their experiments they did not use the common, underlying principles that the sand-molder uses. You go into a foundry and there is a pile of sand, upon which the molder puts his molding-board to make a base. If he has put it on a rough layer of sand, and put his whole weight on it, he wouldn't get it seated. What does he do? He shakes it a little bit, and finally it bases itself. In other words, the grains of sand would naturally lie on top of each other with direct pressure, but by a sliding and wiggling motion you will roll one grain over the other until finally you can get the board seated on a flat surface of sand. In the same way you can get the inlay much closer than you could by putting on ten times the amount of direct weight, which so many dentists do when they put in there a wedge to push the inlay to its place. When the surplus of cement is squeezed away you see quite a decided line which you are almost certain has much more width to it than 1,100th of platinum, showing that putting direct pressure on the inlay has not squeezed out the cement, because the particles of cement rest on top of each other, and could not get away.

In putting in an inlay instead of putting that kind of pressure on it, I put it to its place and draw a wide piece of tape over the inlay, the same as though we were polishing a gold filling with a polisher. I take a piece of tape a couple of times as wide as the filling, and as you pull it through it will always have some surface of the tape in contact with the filling. Pulling it through that way two or three times wipes off all this surplus that prevents your seeing a real nice margin. At that stage some would put a wedge in. In putting a wedge in they would see a little of that squeeze out, and by putting more pressure on it they might get considerable out, but after you have gotten all out you can possibly get, if you take a piece of tape about one-sixteenth of an inch wide, and rub that over the filling, that is, from here to here (indicating on illustration), it does this: It keeps teetering that thing from one end to the other. Keep going over it, and you will be surprised how much closer the inlay will become seated than though you put on any amount of direct pressure.

With relation to the difference in the high and low fusing materials, they all have their good points. The idea that it is low in strength if it is low fusing has all passed away. The question is, which one you can manipulate and get the best results out of. I will tell you where I think the advantages of high and low fusing porcelains come in. The fact that Dr. Jenkins' porcelain, for instance, is a flowing porcelain—when it becomes melted it is a liquid and has a tendency to flow, is an advantage in smaller cavities. It is an advantage where the cavity is saucer-shaped, and all the form it needs to have is the filling up of the saucer. Then when you come to build up corners, while you can do that with Dr. Jenkins' porcelain, at the same time you have to watch it to keep it from getting into a flowing condition. There is a danger point there, and you have to pay unusual attention to detail to keep from carrying it over that danger line. In the smaller cavities I would use a porcelain that had a tendency to flow. When I wanted to build up a great big contour, and wanted the cusps to stand up and retain the shape I have given them, I would use higher fusing porcelains. Often there are men who become exceedingly expert in putting on the Jenkins' restorations. So far I have never seen any of those Jenkins' restorations, either from my own hands or from the hands of other dentists, where the restoration was as nice as where the man used high fusing material, because high fusing material has the physical peculiarities which make it better suited for these cases.

Those are the two extremes. Now, in comes Mr. Brewster, within a month or six weeks, and brings us another low fusing porcelain that has all these qualities of standing up at the corners that the high fusing has. You have to keep in touch with these things every minute or you will get behind the times.

A MEMBER:

In the use of porcelain, have you ever noticed a disintegration of the surface of the filling? I remember with the old glass inlay we used to have disintegration in the mouth, the surface roughened, and I have noticed several low fusing porcelain fillings that seemed as if the surface had been roughened. Whether that was due to the filling or not, I don't know.

Dr. Taggart:

Years ago, when those glassy preparations were put on the market they would become etched and roughened by the fluids of the mouth, but with these later low fusing porcelains, starting with Dr. Jenkins' I have never seen a particle of disintegration of the surface after long-continued wear in the mouth. The fact that you have seen some of these low fusing porcelains, with the surface roughened, and knew them to be modern low fusing porcelains would be accounted for by the fact that the ease with which they are baked makes them sometimes over-baked, and the little bubbles don't show when the fillings are first inserted, or the dentist, knowing they are there, does not have the manhood to start over and make a new filling. The wear and friction in the mouth would eventually burst the bubbles through, and that would give an apparent roughness, but I do not think it would be possible for any of the fluids of the mouth to affect the low fusing inlay.

Dr. Rohland:

Will you be kind enough to describe your method of low fusing?

Dr. Taggart:

There are so many methods by which that is done. I have all kinds of furnaces, and it depends on which one is in commission at the time. I bake with a nitrous oxide flame, but if I was going to teach anyone how to do it, the main thing would be in the biscuiting process.

Another point is this, the harmful effect of these sloppy clinics, demonstrators sent out by supply houses, as well as clinicians at our own meetings. It seems to be a peculiar trait in a man's character who accepts an invitation to do anything, to show how easy it is. This morning I saw a man showing how to make an inlay, and he was doing it with his thumb in the way of a tool, and a spatula—well, I likened it to an Irish bricklayer up on top of a six-story building throwing a wad of mortar in between the bricks. (Laughter.) He would take it and throw it in, and give it a push, and show how easy it could be done. I have worked thirty years trying to make porcelain inlays, and I have tried to learn how to do it right, and how to speed up, and here is a man that comes in and gives a clinic, and has only worked a few months. He did this morning in less than two minutes what I can not do in less than twenty. If there is any benefit in that kind of teaching, I can't see it. The man who doesn't know how to do it goes home and tries it that way, gets poor results, and says there is nothing in it.

Some of my Chicago friends have heard me relate this instance. Dr. —— has been a worker in porcelain, and before I knew him personally I would read his articles, and felt highly pleased that a man could attain such results. I was trying to get there myself. One time I read that at a clinic he had started and finished a porcelain inlay in thirty minutes. That discouraged me, because I was taking an hour or an hour and a half, two hours and three hours, making it, spoiling it, and working it over. That was my method of trying to attain results, and when I heard that he would do this in thirty minutes I was discouraged. I said: "Taggart, what is the matter with you? Wake up." I tried to speed up, and finally, before I met him personally, although I had known him through correspondence, his associate, who lives in Salt Lake City, came through Chicago. He came up to my office and told me that Dr. —— had sent his greetings through him, and wanted him to be sure and not come through Chicago without seeing me. As he was the doctor's associate, I felt more like taking him in. I took him into the laboratory, and I commenced to talk about porcelain work, and I related the instance about the thirty-minute inlay. I said to him: "I would give anything to see how that was done." He said: "I can show it to you, because it is in my mouth." I looked at it. It was one of the lateral incisors, where there would be a natural depression, a general saucer shape, with a little defect in the bottom of it, on the mesio-proximal surface. There had evidently been a very careless preparation of the cavity. I did not like to criticize it, but I looked at it. I said: "He did that in thirty minutes?" The reply was "Yes." I said: "Well, he is an awful slow worker. I could have done that in twenty minutes if I had done it that way." (Laughter.)

Dr. Hart J. Goslee:

The combination of enthusiasm and encouragement tinctured with conservatism, is an admixture which acts as a stimulus to real scientific and practical development, and for this reason Dr. Waltz's paper commands commendation.

He essays to enthuse all with the possibilities of porcelain work as applied to the filling of teeth, and to encourage the adoption of this method as a part essential to the complete equipment of the modern practitioner. He insists that for this purpose porcelain occupies a permanent place among other materials, but at the same time he emphasizes the limitations which circumscribe its application, if success is to be achieved, and if disappointment and failure are to be avoided.

We agree most emphatically with the logic of this doctrine, in general, and with the statement that porcelain should be considered only as supplemental to, and not supplanting other materials, in particular, and also with the further statement that *favorable indications* for its employment should confine its application in the main, to those cavities in the anterior teeth which are within the range of vision, and where, for esthetic reasons the use of gold in this day of dentistry would be quite out of the question.

When we go beyond the purely esthetic demands, however, excepting in the class of buccal or cervical cavities which have been mentioned, and for the reasons given, and when we expect a permanent resistance to masticatory stress, we exceed the reasonable limitations of any friable material, and the use of porcelain is therefore contraindicated to the same extent that it would be indicated in the former class.

The requirements of cavity preparation as applied especially to the depth and to the margins, and which so completely revolutionize the primitive ideas in this connection, are sound, and the stress placed upon the technique incident thereto is timely. As a rule too little attention is given to this portion of the procedure and as a result many well made fillings are failures.

With the essayist I am opposed to the use of anchorage pins or posts in the restoration of incisal edges or angles, for their presence is always an element of weakness in the porcelain restoration, and they serve no purpose that can not be obtained by extending the porcelain itself to a further depth into the tooth, and should this latter even demand devitalization of the pulp, such a procedure would usually be warrantable, and offer more permanent results.

As relates to the question of "high" and "low" fusing bodies I agree with the proposition that either, when used where indicated, is better than gold; that good results are to be obtained from each, and that one should employ that grade with which he individually is able to achieve the best results.

The employment of low fusing bodies offers the advantages to be obtained from the use of gold as a matrix material, and from overcoming the possibility of a change of form of the investment with which it is surrounded during the fusing process, combined with the lesser degree of heat required to vitrify the body, while the greater translucency of the high fusing bodies offers unquestionable opportunity for a closer matching of the shades of natural teeth. When this is combined with the greater stability of form and color which are characteristic of the latter it will be seen that each method possesses some distinct advantages over the other, and it would therefore appear reasonable to conclude that both methods should be employed as the occasion and individual requirements may seem to indicate, and that by this means the highest esthetic possibilities may be obtained.

The color problem will always be a difficult proposition with either class of bodies, and its solution is largely a matter of personal equation. A tedious study of layers and combinations of colors, however, is not so essential as is a familiarity with the colors which we have and which we desire to match, and with the effect of light rays upon them at different angles.

I also agree with the essayist as regards the etching of the under surface of fillings, and believe that hydrofluoric acid should be used *only* where no opportunity for grooving with small disks in the manner indicated is offered. Such a procedure should always be resorted to when possible, and the cavity should then be roughened as suggested in order that the adhesive properties of the cement may be mechanically aided to the greatest extent permissible.

Having thus far agreed with the paper in general, and because of its uniform excellence, I hesitate to criticise any of its features, and yet, the practicability of immediate separation in all cases is questionable. That ample separation is demanded for this class of work is certain, but I am of the opinion that the slower means of accomplishing this with cotton, tape, temporary stopping, etc., is usually preferable, and that if the necessary space is so acquired, fewer sore teeth and less damage to the cervical tissue and cavity margin will result, and that better opportunity for adapting the matrix to the cervical margin will be afforded.

In conclusion, I desire to emphasize the essayist's statement regarding the discouragement which must at times confront the beginner, but this should not dishearten even the most conscientious operator, for, since it is by our failures that we learn, such are but stepping stones to the acquirement of a degree of proficiency which will ultimately enable us to either overcome, or greatly reduce them, until the proportion will not exceed that of any other class of work.

Dr. C. N. Thompson, of Chicago:

Mr. President.—I had intended to keep quiet, because I felt that I had more to learn than I had to give; however, there were one or two points in the paper that interested me, one of which was the shade problem in connection with the line or layer of cement between the filling and tooth, throwing a shadow through the filling. That I believe is only possible with a filling that is all of the same material or fuses clear through, and it is one of the strongest arguments, I think, against the low fusing body. It has been my custom, following the plan first talked of by Dr. Reeves, to build the filling, starting first by restoring the dentine with a substance that is opaque, more because the surface is of a vitreous nature than because of its real opacity. For instance, a piece of glass which is nearly transparent, if crushed to a fine powder becomes opaque because the light is so reflected among the particles that the rays are lost, as it were, in echoes, and if that surface, the same as the crushed glass, could be left on the foundation body that is to reproduce the dentine, we have a surface that, while it will return the dentine color, is practically opaque. Now, if the dentine is restored with such material, it is absolutely impossible to throw a shadow through it, because it will not accept a shadow, and that reduces the amount of shadow that can be thrown to the thickness of the enamel body that covers your foundation.

Now, it is my custom to reproduce the dentine just as nearly accurately as possible, even to the little fine line that you see nearly to the enamel end of the tooth, and then lay the covers on, very dense and very thin, allowing complete reproduction of the enamel, which should be semi-translucent, so that the colors will come out through it blended.

The matter of reflection and refraction is something that we ought to study, and I have aimed to give the matter some thought, but at the present time I don't think it would be wise to broach it.

There was one point in connection with cavity preparation mentioned, and that was the preparation of the cavity side of the wall at the incisal margin, as shown in this upper cut. It has been my experience that if that surface can be hollow ground, so that the margin, this being the labial margin of the cavity, will be more prominent than the under parts—hollow ground in this shape, we have a tooth substance covering that layer of cement from direct gaze. I speak of low fusing bodies as those that will flow through their entirety at the last bake, but I understand that there are low fusing bodies that have a foundation body upon which the colors and enamel can be baked upon the same plan as the high fusing, and if so I do not see why they would not be equally good. I have never tested them for strength. I think, from what I have seen, that high fusing bodies give the most life-like appearance to large restorations.

The matter of cavity preparation is one that I consider of great importance, and I really believe that it is of more importance all the time. The cement question will be solved, of course, when we get something transparent.

In connection with what Dr. Taggart said about the strips of tape, it is a good suggestion, and I have used rubber dam the same way, because I could look through the rubber dam and see what is going on, and when you get a piece of rubber dam that is strong enough it appears to me to answer the purpose fully as well.

DR. C. B. ROHLAND, of Alton:

In discussing the relative merits of low fusing and high fusing bodies there were a few points, it seems to me, that have been omitted, and which have led me to wonder whether the low fusing would not be a pretty good thing to use, after all. It is admitted that you get good margins, and that it is strong all the way through. The only objection urged against it is that the color would burn out. Is that not probably because it was fused too high?

I arose more particularly to give a little trick I have in connection with the retention of inlays that may possibly be of assistance to some of you here. Etching is one of the methods used to increase the hold of the cement on the inlay. Grooving, very small inlays particularly, is a very hard thing to do. It is almost impossible to do it. Suppose we could make the inlays, especially the medium sized ones, hollow, wouldn't that be an ideal way of retaining the filling? Like the hollow gold inlay there is a space to hold the cement, and in connection with the roughening of the surface of the cavity, it seems to me that the retention there would be strengthened very materially. Where low fusing is used I have gotten into the habit of laying on the inside of the matrix little pellets of gold of proper size, and put into places where it would serve to help retain the filling. I am in the habit of varnishing the inlay with shellac, which you have all heard of, so that there shall be no adhesion of the porcelain to the gold, so as to change its form. By placing one or more pellets of gold in there it would stick to the matrix, and the porcelain fuse right around it. After the inlay is fused you can pick the gold pellet or pellets out of it and it leaves a cavity or cavities into which you can put your cement, and it gives that much of an additional hold to it. For the high fusing I have used plumbago—ordinary lead pencil. It will stand the heat, and I have observed no change in the shade from the use of that. I have used this now for several years, and I see no objection to it. It certainly is a great help in retaining the inlay in its place.

I wish especially to commend the essayist for his very able paper. It gave evidence of thought and careful preparation, and in my judgment most of his contentions are sound. The paper is well worth careful consideration. I trust we may hear from Dr. Waltz again.

Dr. Waltz, in closing the discussion, said:

I am very grateful for the treatment of the subject at Dr. Taggart's hands, and what he said is of great importance to me because, without meaning to compliment unduly, I think that Dr. Taggart ranks as one of the most skilful operators of our country, and that is equivalent to saying of the world. Dr. Goslee disagreed so slightly that I have little to reply to in his remarks, except in the matter of separation. Immediate separation may be something of a hobby of mine, but by this method I believe adequate space can be secured without any great inconvenience to the patient—the cavity prepared, the filling made, the separator removed and the patient dismissed after a single sitting with no after-trouble except a slight soreness for a day or so, and not always by any means is this slight soreness noticed. Compare these conditions with those present when the slow method is used. Three and four visits to the office previous to the operation are necessary, and during this time—a week to ten days or more—there is a misery and soreness of a number of teeth which one has not to personally experience to have a dread of. The slow method is necessary sometimes, but it is more applicable to the practices of some of our members who are in the large cities. The majority of us are in that position where it is better to see the patient as few times as need be, and immediate separation, secured with the Perry separators, enables us to do that very perfectly, and without any punishment. While in the infirmary I regretted very much to see students going out possessing none of the forms of the Perry separator. I did all I could to have every student get one. Once an operator has accustomed himself to the use of the Perry separator I believe he will seldom employ the slow method, not only out of consideration for the patient but as a matter of personal convenience. I do not believe there is any other separator that will do the work as well and consider immediate separation and the Perry separators almost synonymous. There is no impingement upon the gum septum in their use that results in any permanent injury.

I made the statement in the paper that I believed as artistic results are obtainable with Jenkins' material which implies the use primarily, though not necessarily, of the gold matrix, as are obtainable with others, and very much more easily in the hands of the average operator. That is the thought I want to impress upon the members.

Regarding Dr. Bryant's question of the burning out of colors. In my hands that has been a difficult matter to control. I do not believe in the detailed and minute discussion of these things in a gathering like this, because I think the color problem must be a matter for every man to work out himself. Every one will secure the color in a little different manner, and I purposely avoided entering into a discussion of that in the paper. My method, however, has been simply to use my shade guide as a suggestion of the color desired, then as I have it before me I can remember more clearly the color I am after, and by taking a very much darker color I can combine them, and approach nearer and nearer until with the final fuse I feel the shade is about correct. The one thing I have been anxious above all others to set forth is that this matter of the porcelain inlay is not a mysterious or occult work, and no one here should hesitate to undertake it. In my own city, and in this respect other cities are similar, there are only two or three doing the work out of a total number of thirty practicing dentists. This material, if it has value, deserves more liberal attention than it has received, and that was my object in reading a paper, which is elementary from start to finish, and carries the process through from beginning to end. It is not more complicated than the paper has represented it to be and I sincerely hope that every "non-user" here will go home and get at it and make some porcelain fillings where they are indicated. It is not a difficult or mysterious matter, is a fascinating work, and it clearly has a place in present day methods. There are very few that seem to have the skill to obtain results after the methods that Dr. Reeves has advocated. I can not obtain by his methods the results that I am able to secure by the method of which I spoke.

In regard to Dr. Thompson's remarks as to layers of colors. He has given his method of securing satisfactory matching and I have tried it. The trouble I have had was not to make an invisible filling before it was cemented in place. That is very easy to do but when I place the cement back of it the whole work appears to disadvantage.

With regard to Dr. Rohland's remarks concerning the undercut that he gets on the cavity surface of the inlay through the placing of pellets of gold in the matrix, I think that is a very much more difficult way of bringing about the effect secured by grinding or cutting grooves in the finished inlay. I have never made an inlay so small that I could not undercut it. It may be unnecessary to undercut the inlay or scarify the cavity walls. No less an authority than Dr. Nyman, of Chicago, makes this statement and I believe carries the idea out in his practice. However, the retention is certainly greater with undercuts than without for the surface area of both the inlay and cavity are considerably increased, thereby offering similarly increased adhesion. The matter of retention of the inlay I think is practically settled. They will not "fall out." Last Saturday I saw a young lad of about fourteen or fifteen for whom I had at Christmas time built up two central incisors which had been fractured through accident at school. They had been broken off so that from the labial aspect one-half of the length of the crowns were lost and the pulps were exposed, making a desperate condition of affairs. I made restorations for him and we were both very much pleased with the result. He lives in Chicago and on returning to his grandmother's for his spring vacation period, he spoke to me upon the street and asked when he could have an examination of his teeth made. Saturday morning he appeared in the office, holding in his hand bits of porcelain which he showed to me saying: "See what I have done, doctor." I immediately suspected the worst and had vissions of a very bad failure. Then he explained that in trying to bring his wheel up the office stairway to a landing, he lost his balance, allowing the wheel to fall on him, the full force of the blow striking against the porcelain restorations. One was completely comminuted and the lingual half of the other split off. I did not remove the latter one because I doubted whether I could do so without ruining the tooth except for restoration with a crown. I was amazed at the strength of retention holding the parts of the other in the cavity. It was the first one that I have had to take out that I made myself, but, similarly with those I have taken out which were made by others, I found I had a fearfully difficult task. I finally succeeded after cutting away the tooth substance so as to completely undermine the porcelain and made another restoration. Moreover the blow had been delivered from an angle to which the cavity preparation opposed its weakest resistance. A few cases similar to this one will settle forever in any mind the question of the retention of the inlay.

DISCUSSION OF DR. BYINGTON'S PAPER, "DENTAL EDUCATION IN THE PUBLIC SCHOOLS."

DR. J. W. MARSH, Warsaw, Ill.:

Dr. Byington deserves our thanks for presenting this important subject to us for our consideration. I trust that his recommendation that this society take up the work of promoting the general knowledge and the general practice of oral hygiene and of impressing upon parents and children the necessity of early professional help will be heartily concurred in. We do not see, nowadays, as much evidence of total neglect of the teeth as we did ten years ago, which shows that the mouth to ear instruction given day by day by dentists to patients is not unavailing. Its weak point is that it reaches only a fraction of the population instead of the whole, and then, frequently, only after a considerable amount of injury has been done, much of which might have been prevented. So it is evident that to do the greatest good to the greatest number, instruction in this matter and the inculcation of cleanly habits should occur at a very early age; the earliest school age is late enough, and it would seem, therefore, that the common schools offer us the desired opportunity.

The essayist refers to the efforts of some of our sister states in this direction. The Mississippi State Dental Association has succeeded in interesting the school teachers in the state and in having incorporated in the elementary physiologies in use throughout the state, a chapter on the care of the teeth. This is a step in advance of us.

I have examined the textbooks on physiology in use in our town. They are recent publications of the American Book Company, and I presume represent a fair average for the state. They contain nothing concerning the physiology or hygiene of the teeth or mouth. One volume does say, under head of Bacteria, "the mouth is usually swarming with them and may be offensive from the decay they cause." But further it is absolutely silent. This can and ought to be changed.

Now, as to compulsion. Compulsory examination of the teeth of school children at stated intervals, with a recommendation by the examiner, as to needed service, would do great good, and probably could not be reasonably objected to, because the expense to the state or municipality would be trifling. But to compel all children to secure such recommended service is quite a different proposition; one for which our country is not ready and which can not be realized until such time as the state or municipality is ready to assume the expense of such service in the cases of a very considerable proportion of the pupils. That time seems to be far distant, but that fact should not deter us from doing now what we can.

Dr. Truman W. Brophy, of Chicago:

Mr. President: It occurred to me when the gentleman was reading his paper, which was very timely, that it was really one of the most important papers that could be read in any dental organization in this country, because it strikes at the very root of the whole evil. If we have a noxious tree growing in the yard, which is only producing thorns and thistles, it is not the proper thing to try to cut off the thorns, but you should go right down to the bottom and take the thing up and destroy it—get rid of the evil. That is exactly along the line of prophylactic dentistry.

If the teaching of our friend Byington would be carried out, as well as that of the essayist who followed him, throughout this state, with this great society to back it up, we will be doing more good than has ever been accomplished in the history of the dental profession.

It has been my good fortune to have visited some of the great municipalities of Europe, and the city which impressed me most deeply, the one that leads the world along this line, is Strasburg, Germany. The essayist has pointed out that the European countries are away ahead of us along the line of prophylaxis, because the governments of these countries are protectors of their people. They not only have the children's teeth cared for, and they make that quite as compulsory as they do their education, but they look after their physical condition otherwise. The law, especially of Germany, provides that every child entering a public school must undergo a physical examination on the same lines as the soldier in our country who seeks admission to the army. He is critically examined in every particular. You can see the danger that the parent might overlook some slight defect, as, for example, an incipient curvature of the spine, which, if neglected, would run on to a distressing, incurable development for life. The little German boy or girl is examined, and if such a condition, under the observation of an expert is discovered, immediately, providing the parent can not employ an expert, the government takes charge of the boy, and that child is given the same tender care that the rich man's child receives. It is so with the eyes. Every part of the body must be examined. The teeth must be examined, and if the child can not pay the dentist he is sent to the municipal dental infirmary, where it receives such care.

I speak of this because I am deeply impressed with the importance of it, and there is no phase of preventive medicine that in my judgment is as important to the welfare of the human family as this very subject under discussion now, the question of prophylactic dentistry.

I am glad this paper has been read, and I am glad to have heard the very excellent discussion of it, and I sincerely hope that the officers of this society may see fit to effect an organization of a committee which will be as enthusiastic as our essayist has been, and whose influence will reach beyond the boundaries of Illinois, because the influence of this society is by no means limited to this state; that they will endeavor to have the school books so written that the children will have a chance to learn something about themselves. A little boy, who is perhaps the oldest of the family, going to school will learn something about these things, and carry it home, so that the father and mother will make use of this knowledge in taking care of the younger ones of the family, and when they grow up they will be in better condition than the older ones.

I hope, Mr. President, that you will see that an organization is effected, and that a communication, backed by all the strength of the Illinois Dental Society, may go to the authors of those books, and to the superintendents of education of our state, and have them impressed with the importance of giving this subject timely attention.

Dr. C. E. Bentley, of Chicago:

There is no subject upon which any essayist might read that appeals so closely and dearly to me as this. Some seven or eight years ago the Chicago Odontographic Society asked a committee to make an investigation of the subject of the care of children's teeth in the schools of all the countries and cities in the civilized world—of cities where the population was over 10,000, and that was done. I happened to be very close to that investigation, and if the essayist will look in The Dental Review, of 1900, he will find the report that committee submitted. In our investigation we found that the countries throughout Europe took a great deal more care, and gave a great deal more attention to this important matter than the United States. We canvassed the United tSates, and all cities over 10,000 replied. We tried to establish the care of children's teeth in the public schools by dentists who would give their services gratuitously in Cook county or the State of Illinois. We came very near to it in Elgin, but it could not be done. In Illinois it was side-tracked because of politics, and I apprehend that any movement that is not gratuitously and persistently carried forward by the tremendous influence of this society will find the same fate that our committee did in Chicago. Some pioneer work has been done in this direction, and I believe the efforts of that committee will be of service to any committee that this organization may appoint.

I second the motion or suggestion of the gentleman, that this society take the matter up. We are now numerically strong, financially strong, morally strong, intellectually strong and professionally strong. We are a factor in this community and State, and we can make ourselves felt. I think this society can serve its members in no better way than by appointing a committee for the purpose of carrying on a propaganda that will have for its object the proper education of parents and children, particularly those in the grammar school, with reference to their teeth.

Another thing, and I propose to make this statement to the Chicago-Odontographic Society. There is a new charter convention that is now in process of formation for the city of Chicago. Its various committees have been divided and subdivided, and I have been very much interested for certain reasons in the work of the committee on education. I have appeared before that committee on several occasions for the purpose of espousing the cause I am interested in. Those men want to give the city of Chicago a charter that will answer for all time. They have taken up the question as to whether the Board of Education shall be appointed or elected. I am not betraying any confidence when I say that they have decided to recommend to the general body that the Board of Education shall be appointed by the Mayor; but great was my surprise when I heard that the personnel of that board shall be a number of citizens who shall be properly fitted for such service, one mechanic, whose business it will be to look after the machinery of the schools, one architect and three physicians (one oculist and one aurist and one general physician). I think it is high time that we should make a plea that a dentist should be placed there, and I am going to bring this matter before the Chicago-Odontographic Society. It seems to me that Chicago might possibly at this time enter the thin edge of the wedge that might eventually be of great service in the State of Illinois.

I agree with Dr. Brophy, that there is no subject that has come up before this organization of more importance than the suggestions contained in this paper. I congratulate you that you have been favored with it, and that it comes from a young man, and I am proud of the young men at this session of the Illinois State Dental Society. If there is anything that is significant of the progress and growth of dentistry at this time it is that the young men are taking a lead in showing us how to do things, and the Illinois State Dental Society is to be congratulated that it has amongst its ranks so many competent and willing young men.

Dr. G. W. Cook, of Chicago:

We discuss a good deal this question of educating the public, and we are always working to get laws to make the public realize our value. I had a conversation not long since with a gentleman who is on a commission that is to bring forward a bill in the legislature, in which there will be some effort made to get insurance for working people. This insurance is to be handled or controlled by a commission of the State. They had to go into some of the reasons why people could not enter into certain occupations, and in the course of their investigation they found it was necessary to look into what part the teeth might play in the causation of disease in general, or the prevention of disease in certain people occupying certain positions. I talked with that gentleman, who has a wide influence in this country as a sociologist, and who has spent a great deal of time in Europe, with regard to this work. There will probably be introduced into the legislature of this State, in the near future, a bill in which there will be certain requirements with reference to preventive medicine. After a long discussion and considerable investigation, going over all these figures with this gentleman, and informing him as well as I could—however, I may say he knew a great deal more about it than I did—he came to the conclusion that one of the important things to be included in that bill would be some provision for the care of the teeth. That would include the grammar school investigation of teeth. One of the difficulties we have on this subject is that in this country there has not been tabulated a sufficient amount of material to show what percentage of people from the age of 7 to 12 is in need of dentistry. The report that was made by Dr. Andrews gave us some of the best evidence we have. He found also that the foreigners that come to this country from the schools in Germany where they had been carrying out this system really suffered far more than the American people from decayed teeth and bad mouths, and were more liable to infection than the American people—right from these countries where the so-called legislation for care of the teeth has been in force. They haven't cared for them. I think I will be in a position to keep more or less in touch with this man for a while anyway, and the bill he will probably have introduced into the legislature will be a bill for the care of people in regard to their health and strength as working people. The sociologists are going to take this up, and I think before we appoint a committee we would better see what the sociologists are going to do in regard to this matter.

Dr. Whipple, of Quincy:

This subject is more interesting to me than any that has been brought up during this meeting, and I want to hide my fear of public speaking long enough to mention one or two things that have pleased me, and express one or two thoughts in which I can possibly help those who are thinking of interesting themselves in this idea. Dr. Bentley has suggested the appointment of a dentist on the Board of Education. I have the honor of being on the Board of Education in Quincy, and in that place we are under the general law. The Board of Education is elected, and the matter is taken entirely out of the hands of party politics. Where the idea originated of putting a dentist on the board I do not know, but at any rate one is on in Quincy.

I want to say to Dr. Marsh that his remark concerning the American Book Company struck me rather peculiarly, because the very fact of the chapter on teeth being in that physiology caused me last year to cast my vote for that particular physiology to be put into the schools of Quincy instead of another that had nothing about oral hygiene.

Dr. Brophy suggested tearing down the tree when infected. The State of Illinois goes further than that. It has a Board of Commission to look after the orchards of this great State, why should they take more care of the orchards of the State than they do of the children's teeth? I am certainly in favor of a law compelling examination of children's teeth. As for the foul air in the different schools of which the essayist speaks, if professional men were on the boards, they would find that the different methods of ventilation would be more closely looked into. In Quincy, we have built three more schools, and each one of the schools has the latest method of ventilation. The atmosphere is changed in every room automatically once in every nine minutes. Drafts from the cupolas are forced from below by heat—warm and fresh air being forced in and foul air out. The thermometer registers the temperature and is set at a certain degree. When that degree is reached, if it is cold, the heat is automatically turned on, and when it has gone too high, it is automatically shut off. The temperature is always the same.

As far as lecturing to the pupils or teachers is concerned, I would feel that possibly the dentist might feel a little hesitancy in going to the schools for fear somebody might say he is grafting. If you would lecture at the teachers' meetings, it might do some good. The teachers could then take up the care of the teeth with the children. Some pupils might not feel that they were able to have their teeth cared for, and possibly a board of dentists in the different towns could be gotten together and could attend gratuitously to the teeth of those who have not been able to afford to pay the dentist.

Above all things I believe the point of the paper most important, is the idea of ventilation and I would heartily second the suggestions made during the discussions relative to insisting upon professional men being added to boards of education.

Dr. C. M. Mead, of Carmi, Ill.:

I am from southern Illinois. Are we ready for this question? I think the State of Illinois is ready for it. I am sure the laity need the education and we should do our duty. Dr. Brophy has struck the key note, and our essayist has given us one of the best papers we have had. The initiative must be taken. Are we going to wait for some other State to take it? We have not waited regarding the question of organization in order to make this society one of the strongest in the United States, and I heard one speaker say the second strongest in the world.

This question is a very important one and it appeals to the best interests of the people. Suppose the people and the statesmen had waited for the political grafter to have started reform. Suppose President Roosevelt, Governor Deneen and Governor Folk and all such grand and noble men had waited, what would have been the result? The political grafter said we were not ready for reform. What is the condition today? We are ready for it and we are getting it. Our first effort may not prove as effective as we desire, but we will gain strength and wisdom in our attempt, hence I think the question ought to be taken up and some method adopted.

Dr. Johnston, of Peoria:

Poor old Peoria has made so much history lately that it seems proper she should be in on this. In 1902, in response to the request of the National Dental Association, through the committee on oral hygiene in the public schools, the dentists of Peoria examined the mouths of about 3,500 school children. Before we had finished our work one member of the school board objected to it and we were obliged to stop. At the next election this man was not sent back, but we never completed our examinations. We had a little slip printed, however, giving the results of our investigation and suggesting a course of action on the part of the parents. These slips were given to the teachers and by them sent to the parents by way of the children. I wish, Mr. President, that I might send a copy of that slip to the secretary and have it incorporated in this discussion, for it gives data which I am unable to supply from memory.

(The following is a copy of the slip referred to:)

"Report for Committee of National Dental Association on 'Oral Hygiene in our Public Schools.'

"To Parents and Guardians: In May, 1902, a committee, representing the above association, appointed by the Peoria Dental Society, made an examination of the mouths of 3,652 children taken at random from twelve of the Peoria public schools. In these 3,652 mouths were found 14,010 decayed teeth which should have been filled, and 1,665 other dental difficulties which needed attention.

"Two thousand two hundred and forty-two children under the age of sixteen had never used a tooth-brush; 939 claimed to use a brush daily, and 470 brushed their teeth 'once in a while.'

"Your attention is called to two facts: First, *perfectly* clean teeth never decay; therefore childrden should be instructed to use a toothbrush daily. This will largely prevent decay, do away with much toothache and save many dentist's bills in later life. Second: The mouths examined average about four decayed teeth each. Less than 20 perfect sets of teeth were found in the whole 3,652.

"Unless proper care has been taken since that time your child's teeth are worse now than they were then."

Dr. Elmer, of Bloomington:

This paper has appealed to me as touching upon a most vulnerable point in dental practice. How many parents come into our offices and are surprised at the fact that we can distinguish between deciduous and permanent teeth by methods other than from their appearance. How many parents come into our offices who do not even know the number of deciduous and of permanent teeth? It is a fact that the ignorance of the teachers and of the parents of the children along the line of physical and dental perfection is lamentable. They do not seem to distinguish at what age a child begins to have his permanent set of teeth. They can not tell about the first permanent molar, whether it should be "shed" as they call it, or retained. The Mother's Clubs meet at various times to discuss cooking schools and other vastly important preliminaries to education and it seems that an effort might be made to have some of the members of our profession appear before these clubs and give them valuable information that they have no other source of obtaining. Some of them learn what physiology they know from their children, who are going to school. Chapters have been inserted in the physiologies in use in the common schools dealing with the effects of alcohol and tobacco on the entire system, which is a good thing, but chapters might also be inserted dealing with the teeth and oral prophylaxis. To neglect the principle of oral cleanliness seems to be the trouble with most of them, and I believe the place to begin is in the public school. I also believe that the agency through which this work should be carried out in Illinois is the Illinois State Dental Society.

DR. L. B. TORRENCE, of Chester:

I have one little boy who attends school. I started him to school when he was seven years old and on arriving at school the question came up with the teacher as to whether or not certain children were of school age. Frank said: "I beg your pardon, Miss Alice, but why don't you look at our teeth?" and he showed her how to tell by the teeth.

I have enjoyed the essay because this is a question in which I am vitally interested. We all love children and if we don't do our duty to them before their age of responsibility arrives, I see no reason why we should expect the children when our age of dependence arrives to take care of us. I believe if the schools of this country would spend more time in teaching oral hygiene and prophylaxis and less time in football, that the future generations would be better off. The mouth is the gateway to every organ of the body. If the mouth is infected we can reasonably expect infection in every other part of the body. Therefore, is it not very important that we should keep that gateway in a hygienic condition? It has been said that the proper time to commence to train a boy is to commence with his grandparents. I believe that is true in this case. I saw an example of that the other day. I was regulating some teeth and a great deal of my trouble was caused from hereditary tendencies. If you will train a child to take care of his teeth that child will see to it that his children and grandchildren do likewise. It is a good principle to inculcate in the mind of the child, because it will bear fruit in the future.

Dr. C. E. Bentley, of Chicago:

I am going to offer the following resolution (which was adopted):

"Resolved, That a commission of five be and the same is hereby created whose purpose it will be to investigate the dental needs of the children of the schools of the State and coöperate with such other bodies whose duties carry them into such channels of investigation, and to report at our next annual meeting."

The President appointed Drs. C. E. Bentley, T. W. Brophy, G. W. Cook, H. L. Whipple and C. E. Byington as such a commission.

Dr. Byington, in closing the discussion, said:

I am very much pleased by the hearty discussion and the action of this society, and also at having my paper commented upon by men who are truly eminent in our profession, not only in this State, but in the United States and in the world. I have my heart in this subject, and I have been stimulating the professors in our schools along this line, and they are also enthusiastic. As an instance, our professor in science (Professor Bonnell) last year and this year also has asked me to save him some teeth, so that he could have the entire school dissect them, and he mounts them, as we did in our Freshman year, and they trace out the pulp canals. I have been asked to read a paper to the students some time this month, and have one prepared as outlined in essay. As Dr. Torrence has stated, you can not begin too soon. The mother that cares for her child will not only clean its little ears, but will take a damp cloth and wipe out its mouth, which is just as important a part of its toilet. The child will grow into the habit of doing those things. If it is kept up from infancy it scarcely knows when or how it has received its training.

In my paper before the students, if I impress upon them nothing more than this, the importance of using the tooth brush, and how to use it, brushing every surface of every tooth, it will be doing a great deal of good. Very few people understand the use of the tooth brush. I also stimulate their pride, pointing out how beauty is marred by neglecting this matter. As an illustration, last week a mother brought in a child, eight years of age, with two first molars absolutely gone, and she almost wept when I told her they were permanent teeth. It is the same throughout the country, and the world, but if the children are taught, the generation of today will be the fathers and mothers of the generation to come, and if we begin this education in the schools now they will teach their young in after years.

Dr. Cook seems to take the view that we are not ready for action. Gentlemen, I would not give a fig for any undertaking that is not backed by enthusiasm. Another gentleman thought that we must defer this until some other body acts, and then follow it up. How would our profession ever attain any progress if we always waited for some other organization to take up these matters?

Dr. Blair:

I am aware of the fact that Dr. Cook wants to take this matter up. He felt that we have knocked at the door of the legislature so recently that we might be rebuffed, and also that the sociologists of Chicago are anxious to take this matter up, and that we might do well to hear from them.

Dr. Byington:

I beg Dr. Cook's pardon. He referred to other countries that are also carrying out this form of dental education, and that decay is more prevalent there than here. Dental education is not responsible for that condition. You have two factors which are responsible, first, their food, and again, they haven' the skill of the American dentists to care for them. We are having efforts made throughout the country at present for pure food laws. Now, gentlemen, it matters not as to the condition of food when it enters the mouth of many, it becomes a most polluted mass ere it enters the stomach, for many thousands of individuals are going about today with nothing but broken-down roots in their mouths, which serve to retain much food. This ferments from one meal to the next, and is carried into the stomach, and results in untold injury, for a man can not feel better than his stomach, a trite, but true proverb.

I want to thank you all very kindly for your reception of the paper and your hearty discussion.

DISCUSSION OF DR. HINKINS' PAPER ON THE "COMPOSITION OF THE ENAMEL AND DENTINE OF THE HUMAN TEETH."

Dr. G. W. Cook, of Chicago:

The presentation of this material from the hands of the essayist, and his co-worker, Dr. Acree, is certainly a subject that deserves the highest praise, and especially that of working out some of the problems of the dissolution of tooth substance in the human mouth. It is very much to be regretted, however, that there is not more appreciation attached to such work by the profession in general than there is, for it would add some strength to the workers in such fields and give them some assurance that such work will be of value to some one, if not at the present it may be in the future.

The investigations of such subjects are usually ignored completely by the gods of science in our profession, and are usually, if not openly, criticized. If they are asked on the quiet by some one if this work is of any value, the self-styled scientific gods usually shake their heads and say, no, with a graveness that forever stamps upon the mind of the inquirer that the work is of no value, and the inquirer is at once impressed with the idea that nothing is good save that which comes out of Israel.

The report of this work certainly establishes a new area in the chemical knowledge of the composition of tooth structure. As the essayist has said, the analysis of tooth structure has been so variable with each investigator, and the results have all seemed so incomplete that it leaves one without the necessary data to take up the study of the chemical changes in the destruction of tooth substance for the purpose of determining what may be the causes, and just how such causes may produce the pathological conditions that we are trying to find out more about.

It matters but little to us as to whether or not we believe in the vitalistic or the chemical hypothesis of the processes that carry on the life force of cellular metabolism. We must, in the study of all disease processes, take into consideration the chemical constituents of the substance that is being acted upon, as well as the agent that is acting. And the want of scientific understanding of what tooth structure is really composed of, chemically, necessitated the work here present by Drs. Acree and Hinkins, and their work has been regarded problems and the work that has been presented in the past and the present by Drs. Acree and Hinkins, and their work has been regarded of such valuable nature by chemists throughout the country that interpretations and abstracts have been made and published in practically all the chemical journals, regardless of language or country; and their work is far more appreciated, read and discussed by chemists than it is by the dental profession.

When we take into consideration that tooth structure is a chemical combination of substances formed under biological processes, and has a specific and definite purpose in the economy of animal life, we can readily see the difficulties that beset the previous investigators upon this subject, as well as those whose reports we have just heard. All the analyses heretofore made seem to have been from the teeth of lower animals. The first and most important note in this report is the fact that they dealt solely with human teeth. It may be said by some, What is the difference, chemically, between the human tooth and that of the canine? I am very much inclined to think that there is considerable difference, from the very fact that the human and dog's teeth are not acted upon identically in the same way by the same chemical agents, such as acids for instance. This phase can readily be understood when we think of the anabolism and katabolism of the two species. While it is true that during the formation of the tooth in the tissues of the jaw the young live on practically the same kind of foodstuff, still it must be borne in mind that the chemistry of the milk of the canine has a much different chemical constituent to that of the human.

Another step that is brought forth in this report in the way these analyses were made, is the fineness of the material to be analyzed. This is a suggestion that is of true scientific value to those who are to work upon these problems in the future. The determination of the water contents of the tooth is another step in advance that is of inestimable value. Also the determination of the difference between teeth that are dried in the air and those that are dried in the vacuum. Some four years ago this question was one that interested me somewhat, and through the assistance of Dr. Mathews we made some comparative weights on this point. Drs. Acree and Hinkins have found that there is a variation of about seven per cent between the two. According to their notes teeth dried in the air lose about five per cent, while those dried in vacuum lose about twelve per cent. We found that the loss of moisture in an atmosphere of a steam-heated room was five and six-tenths per cent, and those dried in vacuum was eleven and fifty-five one-hundredths. So it will be seen that the variation between their figures and ours was not so very great, especially those dried in vacuum. While there is more of a variation than a half of one per cent of those dried in the atmosphere, this variation might easily be accounted for by the variation of the moisture of the atmosphere surrounding the two different masses of tooth substance.

The essayist calls attention to the fact that the ash of the enamel and dentine was always the color of a dark gray or nearly black, the cause of which they did not determine. Dr. Mathews and myself were of the opinion and by the analysis that this discoloration was due to the sulphur present. Our analysis, or rather the ash, was produced by bringing the material to a white heat in the manner that the essayist has just described, with the exception that our ash was procured by heating to a white heat in vacuum and then we determined the presence of sulphur, leaving the ash in most instances absolutely white.

Since reading over Dr. Hinkins' paper and looking at the contents of the table appended thereto, I have wondered if we were not incorrect in some of our steps upon this particular point in our work. One of the principal reasons for making these analyses was to determine if possible the causes of discoloration of tooth substance when the pulp of the tooth had been removed. I see by the analyses of Drs. Acree and Hinkins that they found iron present, which we were unable to find in our work upon this subject. They also found oxide of aluminum. The oxide of iron and the oxide of aluminum were given together as amounting to twenty-six one-thousandths, while our analysis of oxide of aluminum showed somewhat in larger quantities than did their iron and aluminum oxides both together.

These points certainly have a fundamental bearing on the discoloration of teeth after the removal of the pulp, and if these analyses serve no other purpose than that of working or reviving the study of the cause of discoloration of teeth, they will be of inestimable value to the practical side of the preservation of the color of the teeth. As I have previously stated, this paper again brings to our notice some valuable points for a better understanding of the physio-chemical structure of tooth substance and its bearing on certain pathological lesions of the teeth, as well as their discoloration. Drs. Acree, Hinkins and myself have discussed these problems and the possible use of such work in the future study of the very obscure problems that daily confront the true scientific man in practical efforts for the preservation of human teeth, and personally I want to thank these gentlemen publicly for many suggestions and assistance in the past. I hope the time is not far distant when they will give us a more clearly defined line of research upon this phase of dental chemistry. Such work as this is long and tedious and can only be accomplished by a step at a time, for almost every moment in such work there is appearing a new phase that has to be investigated in order that we can clear up a certain point in a particular problem.

If I have helped in any way to elucidate any point of this paper to any one, I will feel that I have served my purpose on the discussion of this question.

Dr. J. P. Buckley, of Chicago:

I hesitate to discuss the paper from one point of view, because of lack of time, and I know that I owe it to Dr. Hinkins to discuss it from another viewpoint.

I want to briefly emphasize that part of Dr. Cook's discussion wherein he spoke of the amount of time and energy and money that is required to carry on such work as this. I am surprised, too, that an analysis of human teeth of this character was not made years ago. When we stop to think of it we realize the difficulties that Miller must have had in verifying his chemical theory of caries. An analysis would have aided Miller a great deal.

Dr. Cook says that Dr. Hinkins has been as yet unable to determine what made the ash dark or brown, but that Professor Matthews and himself have determined to their own satisfaction, at least, that it was due to sulphur. I am not one of those gentlemen who are anxious to question a statement of that character, but considering the various colors that it is liable to produce when burned, I would like to know how it is possible for sulphur to produce that discoloration when the tooth has been reduced to ashes by means of heat.

One thing further and I am through. Perhaps a majority of this audience knows that some years ago I advanced a theory on why the teeth discolored when the pulp died and underwent the process of decomposition. This was questioned by Kirk and Cook and some others. I want you to understand here that we cannot take the pulp from the canal and tubules of the tooth after it has undergone the process of decomposition and analyze it as Dr. Hinkins has analyzed the tooth itself. We have got to advance theories. In that theory which I advanced, the presence of iron was necessary, and Cook, of Chicago, even more than Kirk, of Philadelphia—Cook privately and Kirk more publicly—thought that I over-estimated the amount of iron that was in the pulp. I tried to explain that the fact that when pulps die they have been irritated, and a greater amount of blood is sent to the pulp when it is in that condition, for that reason we have more iron in the pulp by reason of this congested condition than was taken into consideration by my friends who criticised me, the iron of course coming from the hæmoglobin of the blood.

I am glad to know that this analysis has been carried on, and I know how accurately it has been done when Hinkins and Acree made it. I think it proves that iron is not only in the hæmoglobin of the blood of the tooth pulp, but is also a constituent of the tooth structure. It verifies that theory of mine, for which I am happy. (Applause.)

Dr. G. W. Cook, of Chicago:

Mr. President, I am glad I did not say any more about the iron business than I did. You remember I admitted in my discussion that possibly we had been in error in our analysis. I am going to see. If I am I can't help it. If I am right I want to know it. In the discussion between Dr. Buckley and myself privately I admitted that there was a possibility of some iron being present in the pulp, but I did not believe it was enough to bring about discoloration of the tooth substance to the extreme we see it, and I am a "leetle bit in doot yit." However, I am open for conviction. I have known more or less of this work of Dr. Hinkins and Dr. Acree, as well as Dr. Buckley, and we appreciate it very highly, because we, as some of you know, were busily engaged looking up some subjects pertaining to the disintegration of tooth substance, and one of the difficulties we encountered always was as to what was really in the tooth substance itself, chemically.

Dr. F. B. Noyes, of Chicago:

I am very glad to have had the opportunity of studying this paper, though it was impossible for me to be present to hear it read.

The paper represents an immense amount of hard and careful work.

Very few have any idea of the amount of labor, and the hours of time that are embodied in the few typewritten sheets of paper. Such a paper reaches too far into the future to be adequately appreciated by the majority, for it is to reach the every day work of a generation yet to come, and those who are interested only with the present have not time for such things.

I am not sufficiently familiar with the methods of quantitative analysis to properly discuss the matter of the paper. There are several ways in which the present paper is much more satisfactory than most others that I have read on the subject.

The teeth used were human teeth and all the details of methods are given, even to the manner of preparation of the teeth for analysis.

I was most interested in the endeavor to determine something as to the nature of the organic matter. I have several times attempted to emphasize the fact that there are two kinds of organic matter in the dentine—the protoplasmic contents of the tubules, and the organic matrix of the dentine, which is a glue yielding substance. A change in the proportion of organic and inorganic matter in the dentine might be caused by an increase of the inorganic element of the dentine matrix or a decrease in the organic protoplasmic contents of the tubules.

It would certainly be very difficult, if not impossible, to determine by analysis the amount of these two kinds of organic matter, and I believe it has never been attempted.

There is one thing I would like to ask Dr. Hinkins about. From the work of Dr. Charles Tomes I got the idea that there was a more or less definite combination of a certain percentage of water in the enamel. From his report I received the impression that after drying a little above the boiling point of water no more water was given off until a very high temperature was reached. From Dr. Hinkins' work I take it that this relation is much less definite than I supposed, and that the amount of water given up at any temperature is dependent in a rather definite way upon the size of the pieces of material. I would like to ask if in his work there was a definite temperature at which the last, and a considerable amount of water was given off?

In closing I want to thank the essayist for his work and for his kindness in sending the paper to me.

DR. HINKINS (closing the discussion):

I am sorry that this paper has not brought out more discussion, because I know I put time enough on it, but as the discussion digressed a little I will digress a little and say that I know Dr. Crouse remembers the time when I opened up on Dr. Harlan for putting glyceride of tannin in the pulp canals of teeth. I presumed at that time that the iron in circulation was ferrous oxide, and if it was ferrous oxide the oxide of iron was soluble in oxalic acid, and the thing to bleach discolored teeth was oxalic acid, with which I bleached a number at that time, but they would not retain the color. From that time to the present I have been satisfied in my own mind that there were iron salts in the blood and in the teeth. The theory that we worked on at that time was that the ferrous oxide or the hæmogoblin in circulation was soluble, but as soon as the pulp was wounded and the ferrous oxide or salts became exposed to the atmosphere there was a chemical change, and the ferrous oxide was converted into uric oxide, which was black and would discolor the teeth. (See DENTAL REVIEW, pages 14, 235, 240, 262. Vol. VIII.) Later, Dr. Buckley came along with his views. I don't think we disagree. I have always felt that an analysis of the human teeth was something that the dental profession was very much in need of, and I have felt, and feel today, that I am not really competent to present this to you as a scientific paper, but I say, gentlemen, without any apology whatever, that my convictions are honest, and I believe we have obtained exactly what I have stated to you. I am willing to stand by it until somebody proves me wrong. In scientific work we want honest work. We don't want hot air. We have too much of that.

Now, I have always liked chemistry. I have spent a good many hours of my life plodding over chemistry, trying to do something not only for the dental profession, but to better myself, and if a man gets a little smattering of chemistry it opens up a new world to him. In order for a man to do good chemical work with the teeth he must be familiar with the substance he is working with in order to obtain the best results. When your executive chairman asked me a year ago to write a paper on this subject I thanked him, and felt it an honor to present a paper. I have given you probably the best efforts of my life, and I will say frankly that this paper has cost me a good deal of money and a great deal of hard work. I have been at work on it continuously for a year and over. I have read hundreds of pages to get a little paper of twenty minutes, and I hope it will be appreciated.

As a result of writing this paper I had the la grippe, and it was necessary for me to go away for a couple of weeks to recover. At that time I found out what a good wife I had, and how much comfort I could get from visiting with my wife and family, and I assure you that from this time on more time will be spent with them and less on scientific work.

I want to say that among the greatest consolations I have had has been to talk to Drs. Cook, Reid and Buckley along this line of work. I have received very great encouragement and many suggestions from those gentlemen, and I thank them for the interest they have taken in the work.

Now, in regard to the analyses. I agreed when taking this subject to get the ordinary inorganic constituents and reduce them is possible to *C. H. N.* and *S.* Not only have I done this much, but I have done more, and have put in more time than I intended to. I have determined very accurately the traces of *iron and alumina, Silica, Sulphur, Sodium, Chlorine,* which were never determined before. The determination of the *sodium* and *chlorine* required some trouble. The combustions were a lot of trouble. The substance had to be burned a long time before giving satisfactory results. I made sets of determinations of *C, H, N, S, ash* that were necessary as *preliminary studies* in order to learn the exact conditions—but I got the conditions right, as you can judge when you compare how close the analyses 1 and 2 of the 40 mesh substance are. No man on earth could do better. And that is one thing I wish to impress you with, gentlemen; you can rely upon these results *absolutely* as being *very close* to the true composition of this material. The organic part of the enamel is too small to fool with at present—my time was better spent on the dentine. In regard to the fluorine—there is really no method that I would trust—I know of a modification of one method that I should like to try some time, but it would take too much time to develop this and I did not think it wise. The teeth are very *Bygroscopic.* Do you know, sometimes that stuff would take up the moisture so fast that I could hardly weigh it? Furthermore, you will notice that I worked out a lot of data in regard to the moisture never done before. So I want to impress you here that the water composition varies greatly with the fineness of the material—the finer the material, the more water it gives up at a given temperature. This work is much more exact in this respect than any former work. I took 110° instead of 100° (or 212° F.) for drying, because not all things lose H 20 at 100°. I generally use 110° in my work. So far as the analyses have gone the results that I have are about as complete, with the exception of the fluorine, as I could make. But what I should like to do is:

(1) Make a study of the organic constituents to see what they are, whether acids, bases, true proteids, etc.

(2) Make a study of the black coloring matter of the ash.

(3) Make a careful study of the sulphur compounds to determine if they are wholly organic, or inorganic, or a mixture.

(4) Make a more careful study of the water constituents of enamel and dentine with a view to proving that the water is partly in chemical combination.

You will notice that the water contents in the enamel, 15.37 per cent, is almost exactly the theoretical for water content of CA_3 $(Po\ 4)_2$. 3H 20.

RECENT PATENTS OF INTEREST TO DENTISTS.

829275. Tooth powder can, John E. Lee, Conshohocken, Pa.
829119. Dental plugger, Frank X. Mellen, Triadelphia, Ohio.
829395. Dental engine, Nathan K. Garhart, Indianapolis, Ind.
829449. Tooth brush, Wm. L. Whaley and H. L. Loring, Chicago, Ill.
829997. Manufacture of plates for artificial teeth, Arthur Ollendorff, Breslau, Germany.
830872. Amalgam carrier and plugger, Hugh W. Arthur, Pittsburg, Pa.
830852. Mechanism for cutting wooden toothpicks, John M. Rounds, Strong, Maine.
831185. Vitreous cement for plugging teeth and manufacturing the same, Josef Rawitzer, Charlottenburg, Germany.
831307. Dental tool, Charles A. Spahn, Newark, N. J.
831489. Dental disk holder, Jacob A. Thomas, Hanover, Pa.
kee, Ill.
831391. Attachment for tooth brushes, etc., James L. Ubellar, Kanka-

Copies of above patents may be obtained for ten cents each by addressing John A. Saul, Solicitor of Patents, Fendall Building, Washington, D. C.

THE DENTAL REVIEW.

Devoted to the Advancement of Dental Science.

PUBLISHED MONTHLY.

EDITOR: C. N. JOHNSON, M. A., L. D. S., D. D. S.

Subscription price $1.00 a year including postage, to all parts of the United States and its possessions, Cuba, Canada and Mexico. All other countries $1.75 a year.

EDITORIAL.

SUITABLE NECKWEAR FOR DENTISTS.

A dentist's work is sufficiently trying without having anything so absurd to encumber him as some of the stiff, high collars that are worn as a tribute to modern style. If he operates all day at the chair, whether he sits on a stool, or stands as most operators do—there are times when to get proper vision of his work he must bend or twist his neck. It matters not if he operates through a mirror, which he should learn to do, there are still circumstances under which it is necessary for the best results in an operation to bend in such a way as to place the neck under tension if it is bound by a tight-fitting starched collar. It is doubtless expecting too much of dentists to ask them to ignore fashion sufficiently to discard the regulation linen collar while operating, though it would add immeasurably to their comfort and even to their health if they would do so. The evils of the high, stiff and tight collar are not recognized as they should be. Aside from the manifest discomfort, there is an element of positive danger in impeding the circulation when the head is bent, causing a congestion in the brain which may work permanent injury. In watching operators at our public clinics it may frequently be observed that they involuntarily reach the hand up to pull at their collar at intervals during the operation, and if they become greatly absorbed in their work and remain in one position any length of time it will be noticed that the face becomes flushed and the veins stand out over the temples in a wholly abnormal condition.

It is needless to outline the train of evils which may follow this state of affairs if kept up long enough, and it is high time that dentists recognized this danger in their work. While they may not have the courage to wholly abandon the absurd neckwear which modern fashion imposes on suffering humanity, they can at least wear collars that are sufficiently large for the neck to admit of considerable movement without undue impingement on the vessels and nerves, and what will add materially to their comfort they may have the neck-bands of their shirts ironed without starch.

A little attention to comfort in dress during the long and arduous hours of operating will not only conduce to health but will actually aid in efficiency of service, and it is better that a dentist sacrifice somewhat in style than to jeopardize his health and comfort by a blind following of fashion.

THE EDITOR'S DESK.

ANOTHER VACATION.

[Continued from October DENTAL REVIEW.]

FROM LAKE MICHIGAN TO PARRY SOUND, ONTARIO.

To read descriptions of places is for the most part tiresome, but to see places oneself is never failing in interest. One of the charms of a lake trip is the calls that are made at the various ports, but I shall not attempt to describe any of those we stopped at. Suffice it to say that all the next day we are skirting the Michigan shore, calling at places and studying the peculiarities of each. After another restful night's sleep we arrive at Mackinac island, where we have breakfast and change boats, taking the steamer "Majestic" of the Northern Navigation Company of Ontario. The next day is spent in running up the beautiful St. Mary's river, through which there passes a continuous procession of craft of all kinds, from the dainty pleasure yacht to the ungainly and weather-stained lumber barge.

Toward evening we call at the Canadian "Soo," and then cross over to the American side, where we coal up for the Georgian Bay.

We leave the American "Soo" about dark and run down St. Mary's river through the night. By breakfast time we are well into the north channel between the great Manitoulin island and the north shore of Georgian Bay, and all day we are skirting the island and calling at ports. The names of some of these ports are significant of the early days when the Indian knew more of the region than the white man. We come to Kagawong, Little Current, Sheguiandah, and Manitowaning—all on the island. In the evening we reach Killarney on the main land of the northern shore—quite a jump in nomenclature, but not much change in scenery. It is all wild beyond description—rocks, water and Indians. Killarney presents the spectacle of a town laid out in streets with not a vehicle of any sort in it. The streets are entirely covered with grass, except where the sidewalks are laid, and the cows are grazing on them. What need have they of vehicles? There is nowhere to drive to and no way of getting there if there were. It is all wilderness and rock, with fish the chief industry. I wish some one would tell me what they do there through the winter months. If a man wanted to get away from excitement and hibernate it seems to me this would be an ideal spot in which to spend the winter, though I fear that if he was active of brain he would be a raving maniac long before the rays of the sun dug him out in the spring. But I don't suppose the

Mackinac Island.

people up there would change places with you or me and live in a big city if they could. Verily, it takes all kinds of people to make a world—else there would have been no Killarney on the north shore of Georgian Bay.

We are glad to go to bed shortly after leaving Killarney, the winds from the water making us very sleepy. The next morning we were well down the east shore among the islands and heading for Parry Sound, where we are scheduled to remain for a few days. We arrived about 11 a. m. and at the dock to meet us was Dr. Cunningham, an old friend and former student of mine, who had placed himself in commission to look after us during our stay. The doctor had never seen my Indian girl, nor The Collector—nor Elizabeth. I was ashore first and had him by the hand. In a moment my Indian Girl started down the gang plank with Elizabeth on her arm and I beckoned her to come to us. A queer, puzzled look came over the doctor's face, and he reported later as having said to himself: "Well—he wrote me that he had two daughters, but I didn't suppose one of them was so young—well, by the lord Harry, if it isn't a doll!" And Dr. Cunningham is not the first one, or the last, that Elizabeth has deceived. I go into a room sometimes myself where everything is

Hotel Belvedere, Parry Sound, Ontario.

quiet and the sight of this prim Miss sitting bolt upright and staring at me so naturally with those big black eyes startles me for the instant in spite of myself. I have sometimes vowed that she had to be covered up when left alone to save my nerves, but, no, sir, she belongs to The Collector, body and soul, and the latter will hear of no such indignity being heaped upon Elizabeth. She declares it would smother the poor thing—and besides it would muss up her curls. That settles it—my nerves have to take it. Which makes me after all not so very unhappy as you might think.

Parry Sound is a town of between 3,000 and 4,000, and is beautifully situated. I was led to philosophize a bit while there, and this is the result: I have come to think that practice in a big city may be discounted many a point so far as enjoying life is concerned, by a practice in a town like Parry Sound. Dr. Cunningham gets more out of life than any dentist I know. He is not a slave. He goes fishing in the summer, curling in the winter, and shooting in the fall, and has many trophies of the sport in his home. He has some of the most beautiful deer heads I ever saw, but what caught me completely was a mammoth moose head he had shot a few years ago. I do not recall the dimensions, but he had the head placed on the wall at precisely the height the moose stood when alive, and I had no idea of the magnitude of these animals till I studied this head A man must have nerve to tackle such a customer in the wilds, and

The "Emerson."

Dr. Cunningham's recital of his experience in getting this one was worth while if I could repeat it—which I can not.

After dinner the doctor took me down to his boat house, and the moment he opened the door I was a slave. He has a gasoline launch which captured me at first sight, and I never got over it. As soon as my three girls saw it they began to question me suggestively as to how I thought such a launch would stand the waves along the shores of Lake Michigan. Elizabeth was the only member of the family who was noncommittal, but The Collector assured me that she knew Elizabeth would be perfectly delighted with such a launch. We were soon on board and skimming across the bay to the music of the rippling water and the chug-chug-chug-chug of the engine. The doctor put me at the wheel and I immediately forgot that I had ever filled a tooth. What a ride it was! In and out among the islands, past summer hotels and cottages with flags gaily floating, and the sunlight sparkling on the surface of the water. There was just breeze enough to fill our lungs comfortably and renew an appetite which we had been vainly trying to suppress three times a day ever since we left home. As we finally turned into the boat house once more (I narrowly escaped giving the launch an amateurish bump against the pier), we all unanimously voted this the acme of delightful locomotion. The name of this launch is the "Emerson," and she is the trimmest little duck I ever saw sit upon the water.

Dr. Cunningham owns an island about twenty miles up the bay in the direction of Pointe au Baril, on which he has a pretty summer cottage, and it was planned that we were to go by boat the next morning and spend a few days at the island. This was precisely to my liking, as I had been credibly informed that the island was situated in a region where the black bass came up and made mouths at people. So I took out a license for fishing—all non-residents being taxed two dollars for the season—and early the following day we were headed on a winding course for Esther isle.

[To be Continued.]

DOMESTIC CORRESPONDENCE.

To the Editor of THE DENTAL REVIEW:

Being a devoted and constant reader of dental literature, I have in many years of reading gained higher aspirations and conceptions in the field of dentistry than would have been possible without such reading. It is the only stimulus to me in leisure hours.

Bernard Macfadden once said that "Optimism is a rare good characteristic at all times," and when one carefully considers existing conditions, one needs it just now in abundance to avoid being infected by the prevailing pessimism.

In a contribution to the *Dental Digest,* July, 1906, Dr. Eugene S. Talbot, speaking of "Errors in Dental Education," etc., etc., commences with a dramatized phraseology:

"We can make majors and officers every year, but not scholars." —*Anatomy of Melancholy.*

This article is not only pessimism but it is pure *anarchism* in its fullest meaning, and such articles should not be published. They lower our profession and tend to corrupt the young and enthusiastic candidates who enter it.

If we are to follow morals, shall we follow the ancient morals of Hypocrates when all science was only in its primitive state, or of the men of today who are abreast with modern teaching?

What purpose Dr. Talbot had in presenting such an article before an intelligent body like the Massachusetts Dental Society I do not know, but it seems to me that this article could not have given pleasure to or inspired ambition in the hearts of its hearers.

If members of a dental society tolerate the reading of doctrines of misanthropy, I am sorry.

We can not respect or follow such teachings, for they do not tend to elevate or broaden our minds; they are not in line with advanced dental science, but on the contrary are the very root of dental degeneracy.

In our routine of life, from the cradle to the grave, we at times feel the need of someone who can fill dark days with kind words. Does it not appeal to every fair minded student, or dentist, that to follow Dr. Talbot's doctrines as he portrays them in his article would mean, literally, inevitable disaster? It would throw us into a state of hypochondria.

We have enough of interest to absorb us, and no one can truthfully say that our researches are limited. Science has no limit. It would take a lawyer 300 years to read the statutes of laws. The medical profession is still investigating. These are facts established, and we can not therefore imagine how any man can venture to say that we "mechanics are limited and narrow minded."

In the name of all fairness I challenge Dr. Talbot to come forward among his confreres and show cause or give some reason for thus maligning the dental profession, which he knows to be one of the most useful and exacting branches of science, and in the practice of which he makes his living.

Let us hope that we shall all follow our pursuit consistently and indefatigably, and be undisturbed by Dr. Talbot's over-pessimistic views.

Respectfully,

BERNARD BRAMM, Chicago, Ill.

PRACTICAL HINTS DEPARTMENT.

EDITED BY G. W. JOHNSON, D. D. S.

[This department is for busy readers. We want short articles containing practical ideas—the shorter the better. No article must exceed 200 words, unless of exceptional merit. Every dentist has some useful hint that has been of value to him, and if he will only put it in print it may be of equal value to others. That is what this department is for. Due credit will be given for every article sent. Address G. W. Johnson, THE DENTAL REVIEW, 55 State street, Chicago, Ill.]

Harmony:—Innumerable and unexpected benefits will be derived from the close contact of men whose daily lives of toil and study are none too easy. Harmony between neighbors, fraternity in the local societies, helpful associations in the state meeting, and a broadening influence in the national association will be enjoyed by all who enter the charmed circle of loyal devotees to harmonious and progressive advancement.—*E. K. Blair, Waverly, Wis.*

Compensation for Dental Services:—We need better compensation for our services, so that we may not only pay our debts, but live. We should make it possible for us to occasionally have a week off, so that we may go out into the woods and commune with nature. This will enable us to render better service, because we are better prepared for it, both mentally and physically. The necessity for rest and recreation should be considered.—*B. J. Cigrand, Chicago.*

Keep a Permanent Record of Your Work:—There is no one thing that will do more to improve the character of our work than by the constant use of a permanent record to discover our failures and faulty work. It is necessary for us to keep such a record if we expect to practice intelligently and improve from year to year. We never know what defective work we do until we make use of this record a few years after the work is done.—*W. A. Hoover, Gibson City, Ill.*

Removing Glaze from Carborundum Stones:—To renew carborundum stones that have become glazed from grinding down teeth containing amalgam fillings, place them in a beaker and cover with a 50 per cent solution of nitric acid, allowing them to remain for two or three hours. Remove and place in a strong solution of sodium bicarbonate for several hours that the acid which has been absorbed by the stones may be neutralized.—*W. H. Tweedle, Hopedale, Ill.*

Administration of Somnoforme:—My own experience with somnoforme is that it is useful in very short operations, such as the extraction of deciduous teeth, or operations upon adults where you can accomplish results quickly, but if you try to prolong the anæsthesia by carrying it on until you have a slight snoring, or administer it a second time, the patient upon regaining consciousness, will usually be nauseated and depressed for a considerable time.—*J. A. Bullard, Chicago.*

Save Your Money:—System in business is very essential. Why should we, as dentists, expect to be taken care of in our old age if we do not look after ourselves? There should be a system in saving as well as earning. We should conduct our practice on business principles, and in accordance with business methods and invest our savings by following the advice of some man who knows how, and be satisfied with four and a half or five and a half per cent.—*George W. Haskins, Chicago.*

Be Careful with Somnoforme:—I hope those who contemplate the use of somnoforme will study it closely with a view to safeguarding their patients as well as protecting themselves, and to those who are and have been using it successfully, I beg of you that you study it more carefully, ever bearing in mind that when you administer it there is a danger connected with the procedure, and never tell a patient that there is absolutely no danger, thus avoiding a stain on your souls should you be so unfortunate as to have a fatality.—*J. W. Ritter, Charleston, Ill.*

Always Make a Charge for Treatments:—A mistake frequently made by dentists is in not demanding proper compensation for the hours of work they spend in treating patients. It is more of an expenditure of energy to destroy a pulp, or to clean out a tooth that has a dead pulp in it, and get it in an aseptic condition and properly fill the canals than to put in any filling. The dentists of our state and of our country are spending much of their energy in doing this kind of work, in advising patients, and getting practically nothing for it.—*Truman W. Brophy, Chicago.*

Making an Examination:—Beginning with the entrance of the patient into the chair, write name, address, date and reference on examination blank. Do not hesitate to ask directly who among your acquaintances was sufficiently impressed with your skill to speak a kind word for you, or something of that sort. Indicate character of attention each tooth requires, together with such notations as will assist in planning out the sittings, having in view the accomplishment of the greatest amount of work in the fewest number of visits possible. Then make reservation on your appointment book.—*J. P. Luthringer, Peoria, Ill.*

Devitalizing Pulps:—Arsenic, if properly sealed in a cavity and left long enough, is much more satisfactory than pressure anesthesia to both the patient and operator, unless the case be one of emergency and then no doubt pressure anesthesia is the method to use. We were taught in college to leave arsenic in a tooth from twenty-four to thirty-six hours only. I am quite convinced that this limited time to give the arsenic to do its work is the reason so many young practitioners are sorely tried by having patients return too soon and upon opening into a tooth, find the pulp still vital or partially so.—*W. E. O'Keefe, Appleton, Wis.*

Tooth Brushes:—Civilization has introduced many new dental diseases. Perhaps the toothbrush is a disseminator and an originator of these diseases. It has been a matter of wonderment to the profession how so many have gone through life with practically a perfect set of dental organs, who have never had a toothbrush in their mouths, while others who have been most scrupulous in the use of the brush have had a continuous pathological history. It is a hygienic fact that the teeth must be kept clean to facilitate their preservation, but it is also a proven fact that the bristle is an imperfect instrument for accomplishing such a result in the face of what may happen to the tissues as an after effect of its use.—*G. S. Junkerman, Cincinnati, Ohio.*

Method of Inserting Crystal Gold:—How many dentists in using crystal golds have taken advantage of the ease of adaptability of some of these forms of crystal gold to a cavity by using them in connection with foil or heavy gold, placing a mass of crystal gold relatively in position, and over it a mat of foil or plate of rolled gold to facilitate the carrying of the crystal accurately to place en masse without the chopping up that is apt to occur in my hands with any form of crystal gold? It seems to me there is a saving of time and of gold, and facilitating of the packing, by using alternate layers of crystal gold and foil in some form, combining in this way the virtues of foil and crystal.—*W. B. V. Ames, Chicago.*

Method of Making Solutions of Cocaine and Eucaine:—The success with these solutions depends upon (1) pure drugs, (2) pure water, (3) fine sharp needles, and (4) thorough injecting. These conditions complied with, an absolutely painless operation can be performed. Have your druggist weigh the cocaine out in 1-grain papers and the eucaine in 2 or 3-grain papers, and keep these in an absolutely clean place and always on hand. Boil the water thoroughly and filter it into a clean bottle; when making a fresh solution, measure out 100 m. in your graduate, and into this put the contents of one paper; if cocaine, you will have a 1 per cent solution; if eucaine, you have a 2 or 3 per cent solution, according to the number of grains in a paper. Eucaine must be boiled to get a clear solution, while cocaine is spoiled by boiling.—*W. E. Tennant, Fond Du Lac, Wis.*

For Sensitive Cavities:—There was a discussion at the August meeting of the American Dental Society of Europe on this subject, in which Dr. Bogue, of New York, told us he used pure carbolic acid first in the cavity and afterwards chloride of zinc. I have been experimenting for some months with peroxide of sodium and now having used Dr. Bogue's hint about using carbolic acid first, I find I can control very troublesome cases with not too much previous pain. For three or four years I have used very finely powdered peroxide of sodium for relieving sensitive places on the necks of teeth, or spots rendered sensitive by contact with gold bands supporting plates. This led me to use it occasionally for troublesome cavities. My present method is: Flood the cavity with pure carbolic acid and wait a minute or so; then put into the cavity a little finely powdered peroxide of sodium without wiping out the acid. This causes some pain. Add a few more grains and commence to carefully excavate. If the rubber dam is not used care must be taken of the gum.—*Henry I. Moore, Frankfort, Germany.*

MEMORANDA.

KENTUCKY STATE BOARD OF DENTAL EXAMINERS.

This board will hold their next meeting for the examination of applicants the first Tuesday in December. Every applicant must be a graduate of a reputable dental college. For further information address the president of the board.

J. RICHARD WALLACE,
"The Masonic," Louisville, Ky.

THE FIRST DISTRICT DENTAL SOCIETY OF ILLINOIS.

This society will meet in Monmouth, Tuesday and Wednesday, December 11 and 12.

It has been necessary to change the date to this time, from October 30-31, at which time it was the intention to hold it. A very interesting program is prepared and all are invited to attend.

H. W. MCMILLAN, *Secretary.*

INSTITUTE OF DENTAL PEDAGOGICS.

The fourteenth annual meeting of the Institute of Dental Pedagogics will be held in Chicago on the 27th, 28th and 29th of December. The following subjects will be discussed:

Teaching of Anesthesia: The Emergencies, How Treated, How Prevented; Teaching of Operative Technic; Teaching of Prosthetic Technic; A Method of Teaching Orthodontia; Teaching Porcelain Technic; Teaching of Materia Medica; Report of Committee on Dental Nomenclature.

W. EARL WILLMOTT.

DR. A. C. HEWETT.

Dr. Hewett's article in the present issue will appeal to those who know him well, aside from its value in therapeutics, owing to the fact that it was written under peculiar difficulty. Dr. Hewett injured his leg nearly a year ago and has been confined to his house and most of the time to his bed, ever since. A man who under such circumstances can take sufficient interest in his profession to write articles for it is younger in spirit than most of us will be at his age. It is a marvelous achievement to keep up a living, active interest in professional affairs when one is bed-ridden and in pain.

OHIO STATE DENTAL SOCIETY.

The forty-first annual meeting of the Ohio State Dental Society will be held in Columbus, December 4, 5 and 6, 1906.

A program of varied and exceptional interest has been provided, and we hope to even surpass the very successful meetings of recent years. The papers are of the best, the clinics numerous and instructive, the exhibits extensive and complete.

The membership of this society has nearly doubled in the past three years. If you are not a member and are eligible, *come* and *join*, but—come!

F. R. CHAPMAN, *Secretary.*

NATIONAL DENTAL ASSOCIATION.

At the tenth annnal session of the National Dental Association, held at Atlanta, Georgia, September 18-21, 1906, the following officers were elected for the ensuing year: President, A. H. Peck, Chicago, Ill.; vice-president for west, D. J. McMillen, Kansas City, Mo.; vice-president for east, George E. Hunt, Indianapolis, Ind.; vice-president for south, George S. Vann, Gadsden, Ala.; recording secretary, Chas. S. Butler, Buffalo, N. Y.; corresponding secretary, Burton Lee Thorpe, St. Louis, Mo.; treasurer, A. R. Melendy, Knoxville, Tenn. Executive council, H. J. Burkhart, Batavia, N. Y.; J. Y. Crawford, Nashville, Tenn.; Chas. McManus, Hartford, Conn.; F. O. Hetrick, Ottawa, Kas.; B. Holly Smith, Baltimore, Md. Executive committee, C. M. Work, Ottumwa, Iowa; V. H. Jackson, New York City, N. Y.; Thomas P. Hinman, Atlanta, Ga. The next place of meeting, Minneapolis, July 30, 1907.

BURTON LEE THORPE, *Corresponding Secretary.*

ANNOUNCEMENT.

The members and friends of the G. V. Black Dental Club of St. Paul (Inc.) will hold their annual midwinter clinic in February, 1907.

Last year we held the largest, best and most enthusiastic meeting ever held in the Northwest, between 400 and 500 practitioners being in attendance. This year we wish to have an attendance of 1,000.

The program is now being arranged by the clinic committee. The operative clinic will be on its usual high order. There will be a number of progressive clinics on both days of the meeting. Several of the best known men in the dental profession will read essays.

The table clinics will be the most interesting and instructive which we are able to obtain. The program and dates on which the meeting will be held will shortly be published.

As this is the only midwinter clinic held in this section of the country, I take greatest pleasure in extending a most cordial invitation to the members of the dental profession in the United States and Canada to attend our clinic.

Special rates on all railroads.

For any further information apply to R. B. WILSON, *Secretary*,
107 East Sixth Street, St. Paul, Minn.

AN OPEN LETTER TO DENTISTS.

NEW YORK CITY, Sept. 24, 1906.

I solicit an expression pro or con from any dentist regarding the question of Preventive Dentistry, with a view of testing the advisability of calling a mass meeting at some early date in New York City to consider the feasibility of setting on foot an advocacy of this subject.

Please confer by letter with any of the list of men named:

Dr. E. S. Gaylord	New Haven, Conn.
Dr. D. D. Smith	Philadelphia, Pa.
Dr. Taylor	Hartford, Conn.
Dr. Hopkins	Tufts College, Boston, Mass.
Dr. Wright	Cincinnati, Ohio.
Dr. Talbot	Chicago
Dr. G. Alden Mills	226 Central Park West, New York City

Lastly, will the dentists named please confer with me should they receive any conferences? I am impressed that the time is ripening for an earnest movement in this direction. It is the most useful and important subject ever brought to the minds of dentists, a really advance movement.

Respectfully,
DR. G. ALDEN MILLS,
226 Central Park West, New York City.

ILLINOIS STATE BOARD OF DENTAL EXAMINERS.

The regular annual meeting of the Illinois State Board of Dental Examiners for the examination of applicants for a license to practice dentistry in the State of Illinois will be held in Chicago at the Chicago College of Dental Surgery, corner Wood and Harrison streets, commencing Monday, November 12th.

Persons in possession of the following requirements will be eligible to take the examination: First, all persons who have been engaged in the actual, legal and lawful practice of dentistry or dental surgery in some other state or country for five consecutive years just prior to application; second, or is a graduate of and has a diploma from the faculty of a reputable dental college, school, or dental department of a reputable university; third, or is a graduate of and has a diploma from the faculty of a reputable medical college or medical department of a reputable university, and possesses the necessary qualifications prescribed by the board.

Candidates will be furnished with proper blanks and such other information as is necessary upon application to the secretary. All applications must be filed with the secretary five days prior to the date of examination, and the diploma must be presented at the time of matriculation.

Address all communications to

J. G. REID, D. D. S., *Secretary*,
1204 Trude Bldg., Chicago, Ill.

THE

DENTAL REVIEW.

VOL. XX. CHICAGO, DECEMBER, 1906. No. 12

PRESIDENT'S ADDRESS.*

BY DR. C. J. MONK, WIESBADEN, GERMANY.

The thirty-third annual meeting of this association lies before us, and we are assembled in this city of Berlin, renowned for the number of scientific men living within its walls and for the amount of scientific work it constantly gives the world, to endeavor to add our mite to that steady stream.

I must avoid detaining you from beginning our exercises, which I trust may lead to notable additions to our mutual knowledge, but desire briefly to express to you my sincere thanks for the honor you have conferred upon me in electing me president of this society for the current year.

I can assure you that I am fully alive to my shortcomings, and trust sincerely, that fate may enable me to conceal them from you during our deliberations here, at the same time I request your most charitable consideration for the mistakes which will arise out of a want of experience in the duties of this high office. Actuated by a desire that our members, especially the younger ones, should be more intimately acquainted with the makings of this society, I have essayed the task of compiling a short account of its history, which, although dating back only thirty-three years, a so-called generation, yet this, as you all know, is a period containing so much progress in dentistry, as to be well worthy of a brief recapitulation of the deliberations of a body of eclectic dentists practicing in different countries of Europe. "Happy is the country without a history" is a saying which may possibly be suitable to countries, seeing that their histories generally treat of the country's wars, but as I shall endeavor, with your kind permission, to show, *not* to the American Dental Society of Europe, and an examination of the minutes of our society reveals an interesting and profitable study.

---

*Read before the American Dental Society of Europe, August, 1906.

When those five pioneers of the American Dental Society of Europe met on the summit of the Rigi mountain on that memorable Independence Day in the year 1873, they perhaps scarcely anticipated that from such small beginnings an association would be in due time evolved of the importance to which this has attained. They had probably no such exaggerated end in view, and were doubtless drawn together as Americans are wont to be, on the annual celebration of the national holiday; and probably expression was given to a long-felt wish to meet periodically to exchange ideas for mutual benefit and progress in their chosen profession.

It may be mentioned as an indication of the spirit which drew them together, that the very first subject for discussion bore the characteristic title, "Associated Effort, Its Influence Upon the Development and Progress of Our Profession," which is as sympathetic a subject with us today as formerly, and undoubtedly gave the keynote to the aims of this society.

The meeting held on the Rigi was apparently only an informal gathering of those five gentlemen, all practicing, by the way, at that time, in the sister republic of Switzerland, but important details were settled; the society was baptized, no doubt with the usual rites, and with a true regard for the eternal fitness of things, the name then given it is the one by which it has since been known.

Those five members had perforce to divide the offices between them, besides undertaking the duties of executive and membership committees. The first annual meeting known to the minutes was held in Bale, November 27, 1873, at the office of Dr. C. M. Wright, now of Cincinnati, who frequently still contributes to our exercises, with Dr. Charles T. Terry in the chair, for the purpose of adopting the constitution and by-laws, and also for the discussion of topics of professional interest, the subject of the first of which I have already mentioned.

Modern as is this subject of "Associated Effort" two others by contrast, discussed on the same occasion seem to us today of rather antiquarian interest, they were entitled, first, "Rubber Dam"; second, "Does the Burr as Used in Burring Engines Injure the Tooth Substance?"

My hearers will be reminded by the mention of these two subjects of the long row we have hoed in the dental profession since this society was founded; it would be difficult for a modern dentist to answer the latter question with becoming gravity. This society has always been foremost in recording its appreciation of the successful efforts of members of the dental profession to further the cause of dentistry, and render the work of the dentist more satisfactory to his patients and consequently to himself, and it is gratifying to note that the first testimonial accorded by this society was resolved upon in Geneva, 1874, to be presented to Dr. S. C. Barnum "for his valuable gift of the rubber dam to the profession," which testimonial it may be added, took the form of "an elegant album, which the committee had caused to be made, bound in blue velvet and embossed in solid silver." The photograph of each member of the American Dental Society of Europe was inserted in the Album.

The meetings, which took place in the following years, witnessed a remarkable endorsement of the wisdom of the policy of those five pioneers in creating this Society, in the large number of members of the profession who visited the meetings, and took part in its exercises, and here it might be mentioned that it was customary in the earlier meeting to simply arrange beforehand for certain subjects to be discussed without preliminary essays. Thus it is not always clear from the minutes what the views of individual members were. A little later, two essays would be read on the same subject before discussion commenced, and in Paris in 1876 the various views were crystalized by a committee in the following recommendation, "that in the future, at least one member be appointed essayist upon each subject to be discussed at the next meeting, with power to appoint a substitute in case the appointer is for any reason unable to accomplish the work." At this same meeting the Ethics Committee made the following report: "That the members of this Society are so far as known in perfect harmony with each other and no breach of the accepted Constitution, By-Laws and Code of Ethics of this Society has been committed by any members to the best of the committee's knowledge and belief." At one of these early meetings a paper on "Tin and Gold Foil Combined as Filling Material, was read by one of the first and most famous Americans to practice dentistry on the continent of Europe, whose name is still held in reverent esteem by many, both patients and practitioners. I refer to Dr. F. P. Abbot, who died in 1886. The subject was not new, but he was the first to make extensive use of the combination in every day practice, and later the interesting chemical action between these two metals was investigated by his son-in-law, Dr. W. D. Miller, who explained the causes which make this method of filling continually protective. That the method came to stay is amply proved equally to protagonists and antagonists by our program for the present meeting which contains a paper and clinic on the subject. At the meeting held in Homburg in 1875 the then very vexed question of extraction of the first permanent molars was discussed. It was some years later, however, that the importance of retaining this as well as the other teeth was first impressed upon this Society, and, if I am not mistaken, the whole dental world by our member, Dr. I. B. Davenport, of Paris. Our esteemed colleague strenuously advocated this method of practice (which has obtained such an importance in the modern era of orthodontia) so as to obtain a perfect occlusion, which is essential to the perfect dental arch, thus placing operations for malposition of the teeth upon a simpler basis and rendering them at once more accurate and permanent.

Paris is always a loadstone to Americans, where, indeed, it is asserted the good ones will find their future paradise, and it did not belie its reputation in 1876, for a number of men foregathered here and much work of organization and development of the Society was accomplished. It also undoubtedly proved a very profitable meeting from the purely dental standpoint. Among the novelties, a member, since deceased, presented specimens of plate work, which is quaintly described as being made of his own metal in connection with celluloid.

The Society is meanwhile growing in numbers, naturally, therefore, it is getting difficult to obviate little points of divergence of views. Thus it appears that at the meeting held in Interlaken in 1877 an animated discussion took place on a report presented by the membership committee, a portion of which report it was resolved to expunge from the minutes, needless to say the members with that feeling of good fellowship and brotherly affection, which has always characterized their relations towards each other, were re-united before parting, upon the unanimous adoption of the following resolution, presented by the late Dr. Charles Kingsley, "that in the absence of any precise definitions in the Constitution and By-Laws, regarding the qualifications necessary to eligibility as active member, that it is the sense of this Society that although this is an American Dental Society, the Membership Committee is not bound to take into consideration the nationality of the applicant, nor to make possession or non-possession of any particular degree, a necessary qualification or disqualification, that the only recognized guide must be ability and willingness of the applicant to comply with the terms of the Constitution and By-Laws, and conduct his professional life in accordance with the Code of Ethics of this Society, and, in short, as a worthy and skilful professional gentlemen." This accepted resolution may be regarded as a cornerstone well calculated to support our liberal Constitution and a sure guide to future officers and members. The above mentioned discussion was an incident arising primarily from the adoption of a new Constitution and Code of Ethics. The above quoted standpoint has since been somewhat modified.

At this meeting many valuable papers were read, and, continuing the practice inaugurated at Paris in the previous year, the executive committee decided upon a list of subjects to be discussed at the next annual meeting, and also took the first step toward deciding the vexed question of the proprietorship of papers read and discussed at the meetings. In this connection it was resolved upon motion that the executive committee request the possession of the papers read, in order that they may be published as transactions of the Society; this resolution was adopted as amended, that the papers should not be published without the written consent of the essayist, which some years later was altered to the present rule.

The meeting in Baden-Baden held in 1879 witnesses the election of Dr. W. D. Miller as member of the American Dental Society of Europe, whose fame, based upon untold labors in the field of bacteriology, has since spread, not only to the dental, but also to the whole medical world, and whom the dental profession has to thank for first putting the origin of dental caries upon a scientific basis.

It is interesting to note that the minutes state that at this meeting Dr. Miller opened the discussion upon the subject of "galvanic action in the mouth, with an exceedingly interesting address, this being a subject to which he has given much attention."

The custom then prevailing of the president delivering his address at the end of the meeting was here altered by motion to that of its being delivered at the beginning. The Society was still endeavoring to maintain its high ideals, for we see at Baden-Baden, 1879, special committees on dental education, dental therapeutics and on mechanical dentistry were appointed, also that the following resolution was passed, which sufficiently explains itself, "that Prof. James Trueman in recognition of the distinguished services which he has rendered to the profession, be made an honorary member of the Society."

It is interesting to note here that a practice at one time much in vogue was stated and discussed as follows: "Is it correct practice to anticipate caries of the teeth by operations for permanent separation?" The society decided in the negative.

My hearers will well appreciate that the methods of dentistry have radically changed, when they also learn that the minutes record the statement of a prominent member of this Society advocating at Wiesbaden in 1881 the drilling of a vent hole underneath the gum as the best treatment for pulpless teeth, and lest it be considered that this Society was lagging behind the mother country it may be noted that Dr. C. M. Wright, one of the charter members, sent a communication from Cincinnati only the following year, commending the American dentists in Europe for their good taste and conservative work.

It was at Ostend in 1882 that the germ theory in connection with lesions of the mouth made its first bow upon our Society platform, Dr. Rodgers of Hong Kong advocating the view that pulpitis, periodontitis, alveloar abcess, etc., were to be attributed entirely to the action of microörganisms. Also a paper entitled "The action of microörganisms in the decay of human teeth" was read by our distinguished colleague, Dr. W. D. Miller, at the same meeting, which paper may be said to mark the first stone on the road of bacteriological research, which Professor Miller has with unvarying progress since followed. Slowly at first and then with gigantic strides this germ theory at first threatened to have every mortal evil that flesh is heir to laid to its door, but with increased knowledge, gained by untiring labors of able investigators, bacteria have been relegated to their proper place, which, however, is one of no small importance. From this Ostend meeting onward the minutes of this Society continually record the results of further investigation by our noted confrère in this field, who in 1884 was appointed our official microscopist, and this Society can contemplate with pride and satisfaction that it was one of the first to have the honor of appreciating and encouraging Professor Miller in his great work.

Your historian has to record the fact that at this same meeting in 1882 a more retrograde paper was read showing the swing of the pendulum in the direction of reverse of progress, advocating the use of arsenic under proper precautions (whatever they might have been) for obtunding sensitive dentine, where the caries had not approached too near the pulp. This method of treatment was, however, combatted by other members. The minutes of this same meeting in 1882 state that Dr. Jenkins described a method of attaching small plates to the natural teeth; he uses a very small plate so as to admit of perfect cleanliness. He sets a square horn in one tooth and a coniform horn in the other, to admit of motion, and a whole row of teeth may in this way be supported by a molar at one end and a cuspid at the other, with a very small gold band resting upon the aveolar ridge. Dr. Jenkins considers it justifiable to devitalize a perfectly healthy pulp rather than submit to the misfortune of an artificial denture. We see here that twenty-four years ago Dr. Jenkins was advocating that form of bridge work now called the saddle bridge, which, with some modifications from the above description, is deservedly so much in favor today.

And so the earlier years passed during which we have been able to follow the minutes of the American Dental Society of Europe. The succeeding years show by the papers and discussions that even year by year the strides made in dentistry were enormous, anyone looking over the journals cannot but be struck by the progress made during the time under review.

In 1884 at Vevey this Society exhibited its strong interest in the subject of the so-called "improper graduation," it having been apparently roused to action by a paper by the late Dr. W. C. Barret of Buffalo, read at that meeting and which subject has been and is still being pursued by our members in connection with other organizations. This paper resulted in two resolutions in the following year at Berlin, which aimed at keeping the membership list of the Society free from improperly graduated persons. We waxed very warm in our denouncement of the ease with which the degree of D. D. S. is flaunted over the length and breadth of Europe, by persons who have obtained it on too easy terms. The storm of indignation has died down somewhat now, the means adopted having been successful in stopping the flow of bogus diplomas at its source, and those who are still practicing under the title of American dentist are being judged by the public on their merits as practitioners, and we can, I think, well afford to accept this criterion. The great efforts made by persons not entitled to style themselves American dentists to practice our profession under that banner should raise the self-esteem of the genuine American dentist on the principle of "imitation being the sincerest form of flattery."

In the later years of our Society life we have to note an increased regard for the comfort of the patient, or rather less disregard of the patient's discomfort. Formerly the only object apparently aimed at by the conscientious American dentist was the perfection of his operations, and Dr. Kingsley, at Coblence, as chairman of the section on Operative Dentistry in 1887, made some very pertinent remarks anent this, and I cannot do better than quote him. He opens by remarking that the greatest progress in operative dentistry had recently been made in the direction of matrices, first introduced, by the way, I believe, by our member, Dr. William Sachs, which contribute to the comfort of both patient and dentist. "In looking back," he proceeds, "over twenty years one finds that much has been done to make operations more complicated, but, thanks to improved instruments, less fatiguing to the operator, but it is to be regretted that the poor patient at the other end of the instrument has not been a gainer in a proportionate degree. Recently, however, certain serious and skillful operators have been bold enough to suggest that it is getting near the time when we should take more seriously into account the question of wear and tear upon the nervous systems of those who are so very unfortunate as to need the application of our skill, and so fortunate as to be able to attain it, and the question is whether it is necessary or justifiable to keep a patient confined three, four or six hours with the rubber dam, gag and saliva pump and numerous other blessings and curses combined while the operator is pounding gold into a broken down molar. which loosens and drops out in another twelve months. The operator stops to eat a sandwich and the poor victim of misguided and overzealous skill sucks a little brandy through a quill. It seems to us quite as important for the dentist to take into consideration the life and health of his patient as the small part of the patient's anatomy comprised in a single tooth." This picture, drawn by Dr. Kingsley, shows that the use of energy and force on the part of the dentist toward the patient had reached its limits and the worm had turned. This view of modern dentistry was apparently shared by others in the procession, as about this time experiments in porcelain were being energetically pursued. Among the most successful of these were those of our member, Dr. N. S. Jenkins, whose opinions evidently coincided with those of his friend, Dr. Kingsley, for, shortly after this, he commenced those experiments in porcelain work which have resulted in such magnificent success, with equal benefit to the patient's nerves and appearance.

To go forward a few years, the first mention of matrix baked porcelain inlays recorded in the transactions of this Society is at Dresden in 1896, when Dr. Jenkins read a paper on this subject, since which time there has been further considerable advance in methods and results, so that we may now safely assert that, given the same skill as is necessary to place a perfect gold plug, especially in proportion to the size of that plug adversely commented upon by Dr. Charles Kingsley, there is an equally good chance, to say the least, of preserving the tooth, with incomparable advantages to the patient's appearance and little or no wear and tear upon his nerves.

The minutes record means and methods in dentistry some of which have become approved while others have had their meteoric day and have disappeared, except as a memory to the older members to whom such ephemeral ideas will occur.

At Heidelberg in 1891 a very important meeting was held, at which a large attendance of members and visitors was apparent, and an entirely revised constitution, by-laws and code of ethics was formulated, and in other ways this meeting was a notable one, and may be said to mark the beginnings of more strenuous effort in our

Society life. These latter years are too fresh in our memory to need a written history, and too recent also to enable one to properly focus the picture in order to obtain the correct perspective; it is sufficient to recall the eminently successful meetings of Cologne, Stockholm, Dresden, the interesting one at Madrid, etc., and to add that progress is still on the lines of Dr. Kingsley's resolution, and trends toward saving shocks to the nerves of patients themselves while under treatment, and the esthetic susceptibilities of those who may be compelled to look at them and their teeth, and, incidentally, let me add, the operator's nerves. The Society has with increasing years increased its bulk, and we may compare with satisfaction the original meeting in Bâle with our present one in Berlin, and be grateful that the efforts of our earlier members have enabled us to enter upon the larger Society life which we enjoy today.

Much as we may feel encouraged to foster this strenuous life, it is not the nature of mankind to be able to flourish upon that kind of fare alone, and forget the old adage, "All work and no play makes Jack a dull boy," just as the Society was founded at a holiday resort and on the nation's most treasured holiday, so it has always been the aim of the succeeding committees to cultivate the lighter side of life. Thus this Society has been aptly termed a Social Club. This cultivation of the social amenities among its members and their ladies is a potent factor in inducing members to assemble at the annual meetings; it is to be hoped, therefore, that this side of our Society life may always be kept in view and assiduously practiced.

Before closing, allow me to suggest that some steps should be taken to effect a more complete set of our archives than is possible at present, and to remind you that with the amount of matter transacted at our plenary and committee meetings the honorable secretary is unable to incorporate everything in the minute book. You will have noticed with regard to the papers and discussions which form such an interesting record in the earlier years that recently the titles of such even are not enumerated. I think it would be advisable were some steps taken to properly record and file the transactions, so that a reference to them may be as practicable in the future as in the past.

I trust I have not wearied my hearers with these reminiscences; my excuse is that which induced me to make this the subject of my address that after thirty-three years of practicing the first question discussed by this Society "associated effort," it is well to stand a while and contemplate with what satisfaction we can, the results of this associated effort, and the road already traveled—to endeavor to show that this Society has contributed its quota to the scientific and practical progress of the dental profession, while it has never ceased to be an association of men actuated by the strongest sense of comradeship and mutual affection; to take a little time to let our memory go back to those, happily relatively few, who have dropped out on the way, and by briefly relating the efforts made by our members to uphold the highest ideals both of professional capability as well as of professional ethics, its isolated condition compared with Dental Societies in the United States should not be so very apparent, nor handicap it in keeping pace with the best methods and ideals of American dentistry; and finally to encourage the younger men, to whom we must look to uphold those ideals and aspirations of this our American Dental Society of Europe.

FLOREAT.

THE TREATMENT OF SENSITIVE DENTINE, WITH SPECIAL REFERENCE TO THE PRODUCTION OF ANESTHESIA BY PRESSURE.*

BY W. D. MILLER, M. D., D. D. S., BERLIN, GERMANY.

The question of the anesthesia of the dentine is one of such vital and practical importance that the following contribution will, I trust, be of interest to dental practitioners as well as to those engaged in a special study of this question, although the investigations with which it deals have not yet been brought to a termination.

There is one point in the treatment of sensitive dentine which may be considered as definitely established: namely, that by the use of sharp instruments, cutting with the least possible amount of pressure and consequent development of heat, and by thoroughly drying the tissue to be operated upon with warm air in connection with absolute alcohol, we are able to greatly reduce the sensitiveness of the dentine in the majority of cases which come under our treatment.

---

* Read before the American Dental Society of Europe, Berlin, Germany, August, 1906.

Other physical agents for obtunding the dentine, such as heat, cold, electricity, have been and occasionally are still used with varying degrees of success, and a great number of chemical agents have been recommended as adjuncts to dryness and sharp instruments. Of these I will only say that a solution of equal parts of chloroform and crystallized chloride of zinc, as suggested to me by Dr. Hofheinz, with an addition of cocaine ad libitum, has given me the best results in cavities of decay. For superficial sensitiveness at the necks of the teeth, nitrate of silver, applied in substance or concentrated solutions and the part protected afterward for a few hours by a covering of Fletcher's artificial dentine, works admirably. Dr. Abbot assures me that the chloride of zinc applied in the same way giyes especially good results without the discoloration.

In Germany considerable use has recently been made of various preparations of the suprarenal capsule in combination with cocaine, injected subgingivally in the treatment of sensitive dentine, and the German dental journals of 1904-1905 are full of articles on suprarenin-cocain, adrenalin-cocain, eusemin, etc.* The suprarenin-cocain has been prepared after the formula of Braun in tablets containing 1.0 centigram cocain and 0.1 milligram suprarenin. A tablet dissolved in ½ ccm. of boiled water injected in the neighborhood of the apex of the tooth will, in a great majority of cases, especially in the upper jaw, produce complete anesthesia of the dentine. These preparations are, however, not without their disadvantages; occasionally cases of poisoning have been observed or of sloughing of the gums, and it is claimed by some that the excessive anemia of the pulp eventually results in its death.

More recently novocain has been highly recommended instead of cocain. It is claimed that it is far less poisonous than cocain and nearly equal to it in its anesthetic action. Misch recommends the following combination:

Novocain	0.1
Physiological salt solution	10.0

---

* For producing anesthesia in extracting teeth these preparations have altogether superseded nitrous oxide and other general anesthetics in most dental practices in Germany.

	Suprarenin boric (1:4000)	10 drops
or	Novocain	0.1
	Physiological salt solution	5.0
	Suprarenin boric (1:4000)	5 drops

But even the novocain-suprarenin combination has its dark side. Hamecher (*Odontologische Blätter,* July, 1906), writes that the pain following the injection is often so severe that the patients affirm that they can not bear it. By an injection of Stovain the pain ceases almost immediately, to return later with increased intensity. Two tablets of aspirin of ½ gram (7½ grains) each relieve the pain permanently. He observed repeatedly considerable swelling; the edema is painful and lasts as long as eight days. Paralysis of the facial nerve was observed four times; it disappeared in a few hours. General complications not infrequently present themselves, such as a feeling of fever, beating of the heart, dizziness, asphyxia, etc. These symptoms disappear only gradually, and often headache remains till the following day. These ill effects are exaggerated, but still it appears that the injection of novocain-suprarenin and similar combinations *for anesthetizing the dentine* is not so perfect in its results as to obviate the desirability or necessity of improving our more simple methods and applications.

It has always appeared to me that our knowledge of the means of obtunding sensitive dentine is for the most part empirical. Almost every known anesthetic has been tested practically in the mouth and naturally with conflicting results, because the conditions are so diverse in different cases and so many concomitant factors, such as the degree of dryness, sharpness of the instruments, skill of the operator and the hypnotic effect on the patient can not be eliminated. Consequently, notwithstanding the millions of experiments that have actually been made in the mouth, we do not yet know what is the best local application for obtunding sensitive dentine.

It seems to me that we ought to be able to accomplish something by experiments on freshly extracted teeth, and in this hope the work to be described was undertaken.

The action of chemical agents upon sensitive dentine will depend in a great measure upon the depth to which they penetrate, and it becomes a very important matter to determine.

Under what conditions do we obtain the deepest penetration?

In the first place the attempt was made to determine the effect of dryness on the penetration. In order to obtain perfectly homogeneous material, blocks of ivory were superficially decalcified and some of them thoroughly dehydrated by use of absolute alcohol and then immersed in a solution of eosin along with others not dehydrated. I was much astonished to find that almost no penetration whatever took place in the former, which I account for by the fact that the alcohol caused intense shrinkage of the decalcified tissue and partial obliteration of the tubules. Drying with chloride of lime gave better results. I did not feel at liberty, however, to conclude from these results that the use of alcohol produced the same effect on human teeth, inasmuch as in caries of the dentine changes take place which make it to differ materially from simply decalcified ivory. The experiments were accordingly continued on freshly extracted human teeth. A large cavity of decay was excavated partially and a thin wall of wax built across from one side to the other (not a simple matter, by the way). One of the two partitions thus formed was dehydrated by alcohol, the other left moist. Eosin or picrofuchsin was now flowed into the separate partitions and after a lapse of 2 to 18 minutes sections made at right angles to the partition to determine on which side the penetration had been deeper. As this procedure turned out to be a very difficult one, I finally adopted the plan of simply sawing the tooth into halves and treating each half separately. As a result of a great number of experiments, I found that *as far as the penetration* is concerned it made very little difference whether I applied the solution to a moist cavity or to one previously dried with alcohol. Sometimes a slight advantage appeared to be on one side and sometimes on the other. *In practice we would obtain better results by operating on the dry dentine, since the drying of itself destroys the conductivity of the dentinal fibrils.*

On a second series of experiments the comparative penetration of different solutions in water, alcohol, glycerin, peroxide of hydrogen, formalin, chloride of zinc, etc., was tested on freshly extracted human teeth. Here I found such slight differences that I came to the conclusion: it matters but little in which vehicle we dissolve our anesthetic. In some preparations there seemed to be a slight advantage in favor of alcohol, while in others the aqueous solution penetrated more deeply. In particular, my hopes that a solution in peroxide of hydrogen would permeate the dentine very rapidly were not realized. Between glycerine and water I found a slight advantage in favor of the water. Glycerine has been recommended as a vehicle for anesthetics, but in my experiments I found almost invariably the aqueous solution penetrated a little deeper than glycerine, and consequently consider an aqueous solution preferable.

The following idea appears to me to merit consideration in this connection: If we wish to fill any porous compressible body with a liquid, we first exert pressure upon it, by which we empty its pores, and by then immersing it in the liquid it will, by virtue of its elasticity, resume its original shape and fill itself with the liquid. It occurred to me that we might apply this principle to our operations by flooding the cavity with the solution and then exerting interrupted pressure upon the carious dentine. I found by experiments that by going over one-half of a cavity with a burnisher, exerting pressure on the dentine, as if packing amalgam, I could obtain a greater depth of penetration than in the half where this manipulation had not taken place. I have not tried this in practice, though I believe it has been recommended in the dental journals. It is possible that if too great pressure were exerted pain would be produced, but I have no doubt that by this method the penetration of the anesthetic would be increased just as well in the mouth as out of it.

One of the methods of procedure which has caused the greatest amount of discussion in the last two or three years is injection into or through the dentine by means of high pressure, obtained by one of the various syringes that have been introduced for this purpose. I have here the Wilcox-Jewett syringe, which I suppose you have all seen; it is claimed that by instruments of this kind one can produce a pressure of 3,000 pounds to the square inch. It is used by simply making a pit in the dentine or cement, it may be at the neck of the tooth, inserting the nozzle of the instrument with a screwing motion to obtain a tight fit, and then gradually exerting the pressure with the lever. A 5 per cent solution of cocaine is generally used. It is claimed that one can obtain perfect anesthesia of the pulp inside of a minute or two, and that is quite true. I have demonstrated by experiments on freshly extracted teeth that we can inject through the whole thickness of the dentine a solution of any coloring matter and thus stain the pulp (Fig. 2), and we can understand that complete anesthesia of the pulp may be produced and the tooth excavated without any pain. The question arises as to what becomes of the contents of the dental tubuli? If we force a solution clear through the dentine, we must dislodge in some way the contents of the tubuli, and one would think that this must bring about a certain amount of irritation of the pulp. We are forcing a liquid under high pressure into a system of tubes which are open at both ends, and if the tubuli are completely filled by their contents, as is the case under normal conditions, these contents, as far as they are liquid or semi-liquid in nature, must be forced out of the tubuli into the pulp. For this reason we are unable to force solution into the dentine by simply immersing the tooth in the solution under pressure, the pressure being then equal at the opposite ends of the tubuli and their contents being non-compressible. (Fig. 3.)

I heard from a colleague, recently arrived from Chicago, that many cases had been observed where inflammation of the pulp followed the application of this instrument. We have not made much use of it here and consequently I am not able to give any facts relating to the matter. The thought, however, suggested itself to me that it might not be necessary to use a pressure anything like 3,000 pounds to the square inch. A pressure of 500 pounds might not even be necessary. By experiment I found that I could press solutions through the sound dentine from a cavity on the occlusal surface of a tooth by a pressure of only five atmospheres exerted for ten minutes. By gradually reducing the pressure experimented with, I found that by a pressure of four atmospheres I could inject liquids through the entire dentine in thirty seconds. (Fig. 4.) Going still further, I found that by taking a rubber tube, drawing the end over the crown of a tooth and ligating it and putting a few drops of an aqueous solution of eosin in the rubber tube, and simply pressing the tube with the fingers, I could press the solution through the dentine and thus stain the pulp. It is plain, therefore, that very little pressure is necessary to force anesthetic solutions through the dentine and bring about a more or less complete anesthesia.

When it comes to applying this principle in practice a great difficulty arises. As you all know, various attempts have been made to anesthetize not only the pulp, but the dentine by pressure, which is produced by the simple method of putting a pledget of cotton sat-

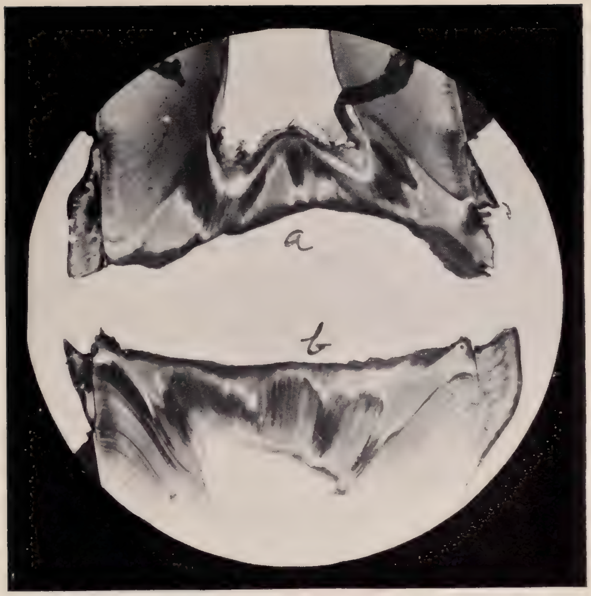


Fig. 1. Comparative penetration of a solution of Eosin in water a and in glycerine b. The dark border shows the depth of penetration.

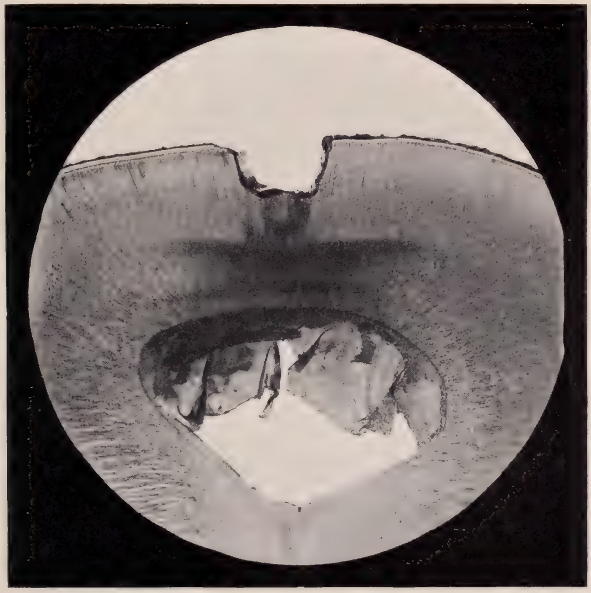


Fig. 2. Aqueous solution of Eosin forced through the dentine by a Jewett-Wilcox syringe in one and one-half minutes. Notice marked lateral spreading of the staining solution; also staining of the pulp.

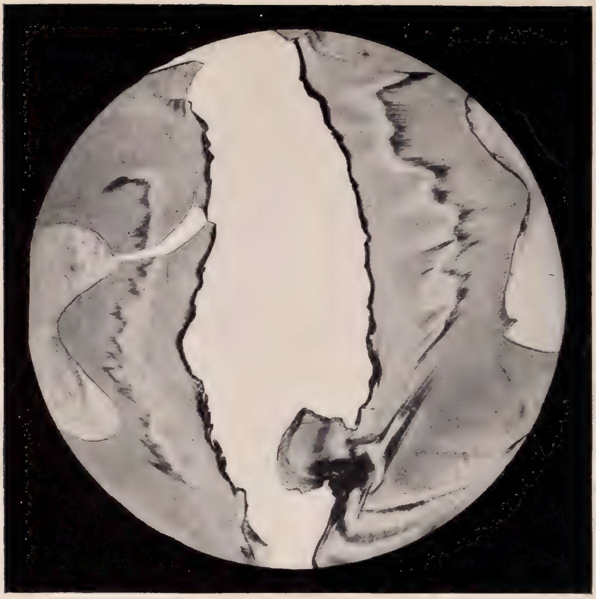


Fig. 3. Penetration of an aqueous solution of Eosin. Right, under a pressure of one; left, of five atmospheres, *acting on all sides,* i. e., not only on the surface, but from the pulp chamber as well; no increase in penetration under the pressure.

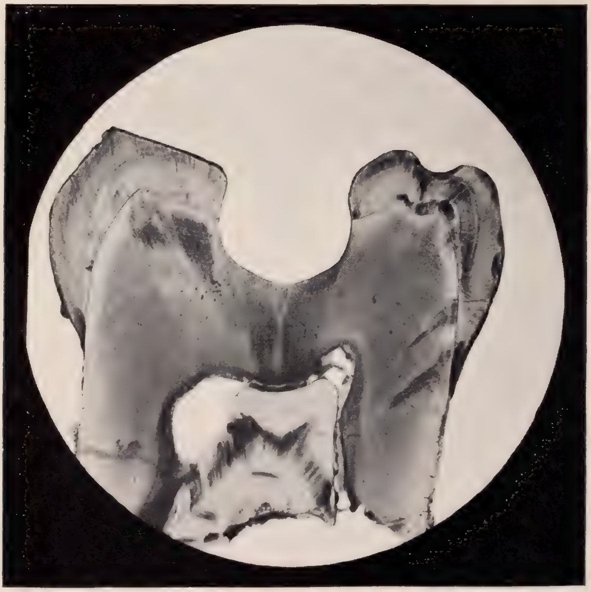


Fig. 4. Aqueous solution of Eosin forced through the dentine by a bicycle pump at a pressure of four atmospheres in thirty seconds.

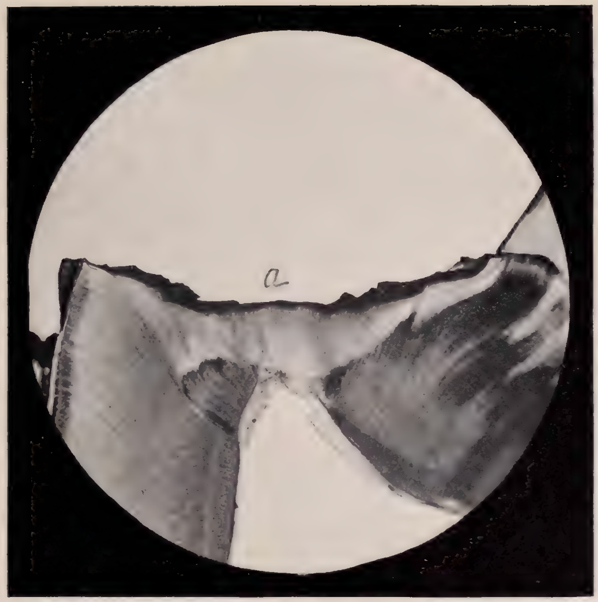


Fig. 5. Penetration of carius dentine by Eosin applied on cotton, pressure being exerted by a steel instrument at a; lesser penetration at this point.

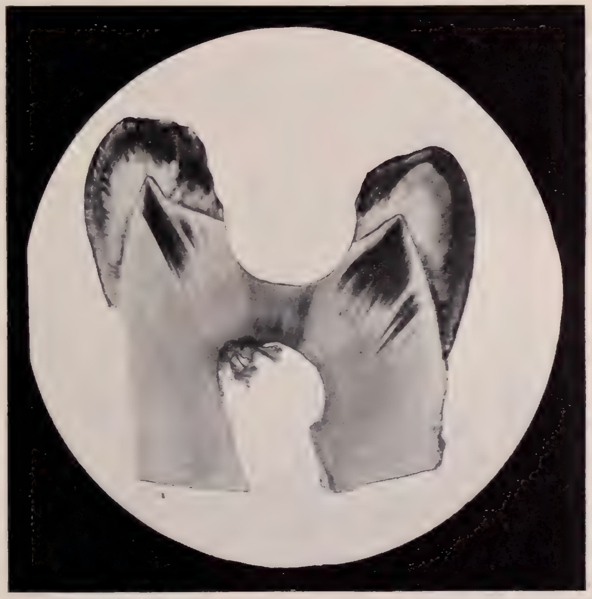


Fig. 6. Penetration of dentine by an aqueous solution of Eosin under finger pressure in one and one-half minutes.

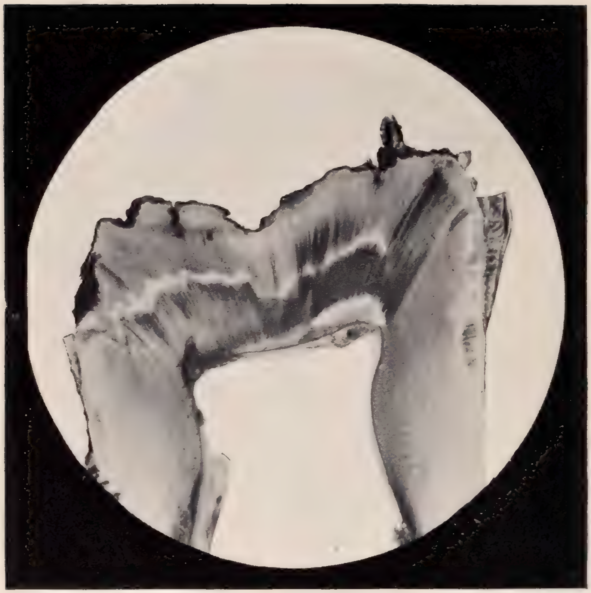


Fig. 7. Slight penetration, under pressure, of dentine which has undergone a process of self repair.

urated with the solution into the cavity, covering it with unvulcanized rubber and pressing upon it with a burnisher. The great difficulty is that the solution oozes out around the margins of the cavity, leaving the cotton dry under the burnisher. Very often we obtain less penetration in that way than if no pressure is used at all. (Figure 5.) In a letter I received from Dr. Jenkins, he told me he has obtained good results by first introducing his anesthetic on cotton, covering this with unvulvanized rubber, and then drawing a polishing strip across the tooth, forcing the rubber against the margins of the cavity so as to obtain a fairly good contact, and then applying pressure by a flat burnisher. By that means he has been able to anesthetize the dentine. For a long time I have been in search of a method by which we could keep a solution in a cavity of decay and exert a moderate pressure upon it. We do not need two or three hundred diameters. Half an atmosphere, the pressure of the finger, will suffice. I thought of soft rubber cup-shaped points of different shapes, approximately the size of the cavity, with holes bored through them, into which we could insert the point of a miniature syringe. Finally the thought struck me that we might accomplish the purpose in the following way. After excavating the cavity as far as convenient and smoothing the borders a bit, take an impression with Stents' composition, endeavoring to get the margin of the cavity fairly well brought out; put a few threads of cotton into the cavity and saturate them thoroughly with a 5 to 10 per cent solution of cocaine, cover this with a small bit of rubber dam, and then press the Stents' impression down upon it. We obtain thereby a perfect closure of the margin so that the liquid can not escape, and one can then exert pressure with the thumb sufficient to press the solution into the dentine. I went immediately into my laboratory and tried the experiment on freshly extracted teeth and found I could press the solution through two millimeters, while breathing twenty times (about 1½ minutes) in a sufficient quantity to stain the pulp superficially. (Figure 6.) I got hold of this idea only two days ago so that I have not had much opportunity of trying it in practice. I had three cases yesterday, one a bad case of caries of the left lower first molar, a sort of leathery decay causing much pain. I attempted, first, by means of a spoon-shaped excavator, to lift out a great flake of softened dentine, but the pain caused was so great that I was obliged to desist. I took an impression and proceeded in the way I have described, and inside of two minutes the anesthesia was so complete that I could excavate that tooth completely without causing the boy any pain. The second case was that of an exposure of pulp in a left upper lateral incisor. I took the impression and proceeded in the same way and was able immediately to extirpate the pulp. The third case was a lower second molar with a cup-shaped cavity; the walls were broken down and there was a certain amount of spontaneous healing of the dentine. In those cases it is difficult to penetrate the dentine. (Figure 7.) I took an impression and applied the method, but did not succeed in producing complete anesthesia, for the reason just stated. I likewise found that thick layers of softened dentine are penetrated very slowly. In a cavity containing a lump of softened leathery dentine, you may apply the anesthetic and wait as long as you please; it will often have little or no effect; esecially is this the case where the cavity is greasy. Also, secondary, and to a certain extent transparent, dentine are permeated with great difficulty. Secondary dentine forms almost an absolute barrier to penetration.

I do not wish to attach too great importance to the matter which I have been able to present to you, but I think that anything that helps us in any way to overcome the pain of excavating teeth is worthy of our attention. The experiments we have been making in this direction have only begun and I hope I may finally arrive at some results which will be of real practical value. I am firmly convinced, however, that in cases where we can get an impression in the way I have described, we can produce anesthesia of the dentine and excavate our cavities with much less pain than would otherwise be possible.

The point I wish particularly to make is that it has been demonstrated with sufficient certainty that we may, by use of *very little* pressure, force solutions through the dentine, and I hope that others of greater practical ingenuity than I possess will be able to devise methods of applying such pressure in the different classes of cavities which we have to deal with in practice. The experiments here related have required far more time than you may think, and I have, for that reason, not been able to complete especially those relating to the relative rapidity of the penetration of different solutions. I hope some of you may take up this work and bring it to a successful termination.

RENOFORM AS A LOCAL ANESTHETIC.*

BY CHARLES P. HASELDEN, D. D. S., HAMBURG, GERMANY.

Mr. President and Gentlemen:

In calling your attention to a new local anesthetic, I do so with the desire of placing in your hands a safe, sure, convenient, and time-saving means of operating painlessly, so that you, one and all, may entirely eliminate the disagreeable factor from your work, however nervous and excitable the patient may be.

As it was my privilege as well as pleasure to call the attention of this society to the merits of cataphoresis in 1896 at our Dresden meeting, so now I make "local anesthesia" my subject, as I firmly believe it is the most important one before us to be solved.

Generally, the world over, if an individual inquire of a friend as to whom he can recommend as a dentist his final question is, "Does he hurt?" I do not think I have one new patient in ten whose mind is not *more* occupied by this question of pain than by that of the work of restoring natural conditions. If I can promise not to hurt I can go ahead and do anything I think best. Before I could promise this they always wanted to "think it over," which was their way of looking for courage.

How many of our fellow workers could and would have other and better results if they were always operating upon insensitive teeth? What a pleasure it is when we occasionally get a patient without "nerves," so to speak, who sits quietly in the chair, takes no notice of chisels, burrs, etc., and allows us to cut, drill, measure, fit and finish our work in peace and quiet?

It was with an unsatisfied longing that this condition might be obtained in every patient that I decided to investigate the claims of renoform as set forth by the chemists who prepare it. Now my feeling is that I had rather have been the discoverer and perfecter of renoform than of any other improvement in the history of dentistry. This being denied me, the next greatest satisfaction is to heartily indorse it, and to give full praise to those who did discover and perfect it.

Credit is given to a dentist by the name of Carpenter for having first used an extract of the supra-renal gland as a therapeutical agent. He was followed by Möller and others until two chemists in Berlin, Drs. Freund and Redlich, finally eliminated all dangerous or disagreeable elements from their product and placed it upon the market under the name of "renoform."

---

*Read before the American Dental Society of Europe, Berlin, August, 1906.

The active principle of renoform is supra-renin, obtained from the supra-renal gland. As secreted by the gland and taken into the circulation, its natural action is that of a check upon the dilation of the blood vessels. A very small quantity injected locally contracts the blood vessels and thus, by shutting off the blood supply to the nerves, they lose all power of transmitting sensation. The effect is enhanced by adding a small per cent of cocaine.

Renoform is a solution of g. 0.00003 renoform, 0.0075 cocaine, 1.00 aq. dist., so 3-1,000 per cent is renoform and 75-100, or ¾ of 1 per cent, is cocaine. It is put up in small, dark glass ampules, which are sealed.

Case 1. The first use I made of renoform was for the purpose of extracting a lower incisor which was loose and in the way. After injecting the contents of one ampule of renoform I waited four minutes, and removed the tooth without giving pain. But one drop of blood filled the cavity and coagulated there.

Case 2. The patient, a school teacher, related that her teeth formerly crowded and the left upper lateral occluding on the lingual surfaces of the lower incisors. She had consulted the local dentist in a small town and he had filed in between the upper centrals, which slightly overlapped. The left central began to tip out and when I saw the patient first the tooth had become a tusk, and the upper lip never closed over it. Her speech was interfered with so that she had difficulty with her school work. She was very nervous and asked a hundred times if it would hurt when I suggested cutting off both teeth and using the two roots to support a central in its proper place. I took a risk and told her no, for I thought I could perhaps uncover the pulp and use pressure if renoform did not fulfill all I expected of it.

I injected the contents of one ampule of renoform at the distal apex of the left upper central, lingually and labially. After waiting four minutes I took a new drill and began on the mesial side of neck of central, boring slowly, and stopping often to inquire if there was any pain or to blow out the chips. As the bur approached the pulp chamber, I expected sensitiveness, but was happily disappointed, and drilled through the pulp as if there had never been any sensitive fibers in it. I then cut labially and lingually with a disk, and removed the crown with excising forceps, cleansed and filled the root. The entire operation was just thirty minutes.

Some patients fear the prick of the needle, but as soon as a drop of renoform has been forced through the gum tissue the needle may be pushed further in and will not be felt. The gum becomes white, and though this condition does not last, still a paleness is present for nearly an hour.

CASE 3.—Lower left first bicuspid, with large saucer-like cavity, with aching pulp, only covered by soft decayed dentine, very sensitive to the touch. I injected renoform at the apex of the root, lingually and labially, and after four minutes, drilled away the dentine and removed the pulp. There was but little bleeding, which I stopped with renoform on cotton, and after disinfecting, the root was filled, cavity prepared, and matrix made for porcelain inlay. Time, thirty-two minutes.

CASE 4.—A similar cavity to Case 3, but no pain, and the dentine over the pulp healthy but sensitive. As, however, I thought it better to remove the pulp because I could get a better shaped cavity and would have no fear of after irritation, I removed the pulp as in Case 3 by using renoform.

In no case has there been any after pain or inflammation of the gum-tissue; and in one or two cases where the first injection did not produce complete anesthesia it was my fault for not injecting enough in the right place, and the solution escaped along the root and neck of the tooth into the cotton roll placed under the lip.

The few minutes needed to induce anesthesia is not lost time, for one can operate much quicker, as well as better, if the patient is not suffering and therefore remains quiet. In general I would say that renoform is indicated, first, for extraction of teeth; second, for destroying pulps; third, for painless preparation of all cavities in otherwise sensitive teeth; fourth, for cleansing the roots of diseased teeth where the gum tissue is inflamed and sensitive; fifth, for preparing live teeth for gold crowns, or bridges; sixth, for permitting painless application of the separator.

A YEAR'S PROGRESS IN PORCELAIN PROSTHESIS.*

BY N. S. JENKINS, D. D. S., DRESDEN, GERMANY.

Such bountiful material has been prepared for us this year that I am constrained to condense, so greatly as possible, the report which I am accustomed to present to you as to the results which have been obtained in my laboratory, or gained by my experience in practice, since our last meeting.

Firstly: I desire to recall my former too unrestrained commendation of pins containing 20 per cent of iridium for crown and bridge work. Such pins are adequate in many instances, it is true, but wider experience shows that pins containing 30 per cent iridium are usually to be preferred. Laboratory experiment indicates that the latter possesses an elastic limit nearly twice as great as the former. This superiority is of great importance, especially in the case of small or weak roots. Thus far the only objection I have found to 30 per cent platinum-iridium pins is that they can not be hammered or rolled to fit special cases without danger of splitting longitudinally, unless previously annealed at a white heat. I have had pins of this alloy made of various lengths, tapering at the point to correspond in shape with the reamers I ordinarily employ, of two diameters, viz., 14 and 16 American gauge, which seems adequate to almost all cases. The convenience of having such pins of accurate alloy ready to hand is considerable.

More than ever I am convinced that the 10 per cent platinum-iridium alloy of about 35 American gauge is ideal for root caps and that countersinking the root to such a degree as conditions indicate is the soundest practice. Such caps can be swaged with great ease upon a metal die with a rubber swager. It is a distinct advantage not to be obliged to make a female die.

In porcelain bridge work connecting wires or rims may often be of 25 per cent iridium. It is hardly possible to make the skeleton of a bridge too resistant, but there are numerous cases where the great rigidity of 30 per cent alloy makes bending to the desired fit extremely difficult. It is of great importance that the alloys with which the dentist works should always be *exact* alloys, otherwise uncertainty prevails and unexpected disaster may supervene.

---

*Read before the American Dental Society of Europe, Berlin, August, 1906.

Secondly: The pure gold solder, which I shall have the pleasure of presenting to you, is a paste formed of pure gold in powder, combined with small quantities of flux, of acids and of a binding material. It greatly simplifies soldering upon platinum, as the paste can be placed in the requisite quantity exactly where desired. The binding material holds it together and in place and the fluxes are in just that proportion which causes the gold to flow freely within the desired limit and yet to have no deleterious effect upon porcelain should contact be unavoidable. This soldering paste is most useful in obscure positions where complete union is necessary and yet where all excess of solder should be avoided. With it the most delicate and yet the strongest work can be done, and, if melted under a white heat, the color of the gold disappears through most intimate union with the platinum, serving thus the same purpose for high fusing porcelain which is obtained through platinum gold solder, remelting or "volatilzation" being obviated. The economy of material is not only notable, but also it is frequently of advantage to be able easily to preserve depressions and fine grooves into which porcelain can be subsequently fused.

We are carrying on experiments to apply this system to all forms of solder, but it requires considerable time to determine the formula for each grade of alloy.

Thirdly: I beg to describe to you two automatic electric furnances. One, "The Roach Furnace," already widely known in America, is designed for inlays and crowns. A lead slug is placed where at a certain temperature it melts and falls upon a lever which cuts off the electric current.

The other is the joint product of my laboratory and that of Herr Heraeus of Hanau. Herr Heraeus has contributed a system of wiring which has great advantages. He attaches his wire upon the inside of the muffle with a porcelain which is his own invention. This porcelain fuses just below the melting point of platinum and holds the wire so securely in place as to prevent sagging and sparking, thus adding something like a third to the life of the furnace. Given a furnace which would have, under the old system of wiring, a life of some seven hundred hours, the same furnace, with this system, should have a life of over a thousand hours.

The contribution of my laboratory has been the size and shape of the oven and its method of closing, together with its system of automatic cut off. This system is founded upon the fusing point of the noble metals and their alloys. Pure gold, silver or platinum will always melt at a certain temperature. So also with exactly made alloys of these metals; they, too, will always melt at a definite temperature.

A plug is inserted into the furnace, carrying a short thin wire which melts at the temperature most desirable for that porcelain which it is intended to fuse. Through this wire a current of electricity passes, but a slight current of only a fraction of one ampere that its passing may not heat the wire and thus cause it to melt too quickly. The wire is, however, exposed to the full heat of the furnace, and when that heat reaches the desired point—the wire melts—the current is suspended—the fusing of the porcelain is accomplished. This process is infallible. Whatever may be the strength of the current, or however irregular its action, when the temperature reaches the fusing point, then, and not until then, is it interrupted. The furnace may then be thrown open, if desired to facilitate cooling, and so soon as the piece is repacked it may be reinserted, whether the oven is still either hot or cold.

No rheostat is required, the connection being made directly with the main. The tedious manipulation of the rheostat and the gentle but persistent tyranny of the electro-thermal pyrometer may therefore be abolished in practical work, although their position in the experimental laboratory remains secure. The ordinary practitioner has usually no time, even if he has the inclination, for experimental work and under this system all he has to do is to place his piece in the oven, turn on the current and leave the result to the unerring action of natural law.

Both of these furnaces are designed to save precious time and to accomplish perfect results. In a practice so large as to require an assistant, whose whole time is devoted to fusing, the saving of time may be relatively less important, but, for the great majority who are obliged themselves to watch every stage of porcelain work, this consideration is of moment.

In the larger oven, and for larger pieces, the perfectly equable temperature which its construction secures seems to produce results in fusing all porcelains, superior to those formerly obtained and this superiority is gained without the least strain upon the eyesight, since no opening is left through which to peep for the gratification of a reprehensible curiosity.

I can not yet tell how far this system may prove to be of scientific importance or how widely it may be useful in the arts, but I am glad to say that it has already shown the correctness of the opinion of those German metallurgists who have insisted that the melting point of pure gold is 1075° C.

There is today in the whole range of our benificent activity no subject of greater interest or of more practical importance than the judicious use of porcelain. Its splendid possibilities came upon us, not long ago, like a summer dawn, "with breath all incense, and with cheek all bloom." Ever since every one of us has been contributing something to its advancement. Even the slightest individual progress is of value and I therefore hope that this report of what the past year has brought to me may be of interest to you also and to our colleagues elsewhere.

INTERSTITIAL GINGIVITIS DUE TO AUTOINTOXICATION. ETIOLOGY.*

BY EUGENE S. TALBOTT, M. S., D. D. S., M. D., LL. D., CHICAGO.

A few years ago the uric acid theory of the cause of interstitial gingivitis was revived when Dr. Pierce, of Philadelphia, amplified the theory of Dr. Reeves that pyorrhea alveolaris was due to uric acid or gout. In this article (1) Dr. Pierce reported three specimens of tooth deposit, examined chemically, in which he found numbers of fine needle crystals of calcium urates, a few crystals of free uric acid and crystals of calcium phosphates. Dr. Pierce based his theory of etiology upon three cases. Being familiar with the uric acid theory of disease, I took exception. Wishing, however, to ascertain the percentage of cases in which uric acid crystals may be found in this connection, I instituted two series of experiments in two different laboratories, neither knowing the work of the other. One series was conducted by Professor Salisbury in the Woman's Medical School Laboratory, the other by Professor Wesener, in the Columbus Medical Laboratory. One hundred teeth with calcic deposits were examined in each laboratory with the following results: Eight per cent responded to the microscopic and murexid tests in one report; in the other, six per cent. The details of this report were published at the time (2). Since uric acid crystals were found in such small quantities and in such a small percentage of cases, it could not be considered a cause. I took the ground that the disease was due to trophic changes or disturbed nutrition. The uric acid theory of diseases at that time had lost ground among thoughtful physicians. At the present time very few believe in it. The prevailing theory is that uric acid is only an expression of systemic disturbance rather than a cause. The article by Dr. Pierce, however, stimulated me to further research and I have devoted my entire time since to the study of etiology, pathology, diagnosis, therapeusis and treatment of this disease. From the standpoint of pathology more than four years were spent in study among animals and human. The result of which I published in my work upon "Interstitial Gingivitis or So-Called Pyorrhea Alveolaris." This was necessary in order to obtain a basis for future work. In the past six years, I have devoted my time to the etiology, diagnosis and treatment. For many years, I had observed interstitial gingivitis among neurotics and degenerates as early as ten and twelve years of age. The absorption of the alveolar process and gums was also rapid in these people from eighteen years on. Soreness of the teeth and inflammation of the gums and alveolar process were observed in children suffering from the eruptive fevers and in women in pregnancy. These symptoms were also observed in the metal and drug poisons and scurvy. The older the individual the more severe the disease. The same law holds good with animals.

---

*Read before the Southern Wisconsin Dental Society, May 30th, 1906.

1. *International Dental Journal,* Vol. XV, page 217, 501.

In changes of climate from a moderate to a high or low temperature causing the eliminating organs to become torpid and not readily adjust themselves to food and environment, the disease in most

---

2. *International Dental Journal,* April, 1896.

cases was marked. These observations led me to inquire into the general condition of the system.

Bouchard has said that "the organism, in its normal, as in its pathological state, is a receptacle and a laboratory of poisons. Among these are some formed by the organism itself, others by microbes—minute forms of vegetables—which either are the guests—the normal inhabitants—of the intestinal tube or are parasites at second hand and disease producing. Man is, in this way, constantly living under the chance of being poisoned; he is always working toward his own destruction; he makes continual attempts at suicide by intoxication. And yet this intoxication is only partially realized, for the organism possesses numerous resources which enable him to escape the intoxication which is always threatening. He throws off these toxic substances into special reservoirs from which they afterward pass out; and, besides, the blood constantly subtracts from the organs the poisons as soon as they are formed in them." When, however, these poisons are not entirely eliminated the blood and system become charged with effete matter and autointoxication or self-poisoning results.

Autointoxication may be produced from poison generated within the body or introduced from without. Frequently patients have undergone the most simple and insignificant surgical operations such as for hare-lip or the most serious and prolonged as removal of female genital organs, operation for gall stone or removal of the appendix, and recovered from the shock. At the end of a few days of apparent recovery they suddenly collapse and die. A post mortem examination conducted with the greatest care reveals nothing as to the cause of death. Sudden deaths have occured to numbers of people who have partaken of certain foods at church and other gatherings. Individuals have died in one, two, three or four days after eating sea foods and stale meats. Epidemics have occurred from poisoned foods and drinking water. Selmi, the Italian toxicologist, was the first to discover that substances were present in the system which when combined with acids formed chemical salts. These corresponded to inorganic and vegetable bases he called ptomaines formed by the action of bacteria upon organic matter. The chemical salts resemble vegetable alkaloids. The term leucomaines or animal alkaloids is used to designate those basic substances caused by tissue metabolism in the body. Not all ptomaines are poisonous. Some are inert. Brieger restricts the term ptomaine to non-poisonous basic products, while those that are poisonous he calls "toxins."

In some diseases, poisons or toxins are poorly eliminated, in others depending entirely upon the nature and location of the disease. If the disease involves the entire system and all the eliminating organs, the skin, kidneys, bowels and lungs, are or can be made to perform their natural functions, many of the poisons are soon removed; on the other hand, if any one of these organs are involved, the process of elimination is slower as the eliminating organs not involved must do all the work. At best this is imperfectly performed. The greater part of these poisons are eliminated by the stools. Owing to the slow movements of the intestinal contents, much of the poisons are absorbed by the mucous membrane. In faulty metabolism or tissue changes, toxins are produced which are absorbed and pass into the lymph and blood vessels. All poisons, producing intoxication whether due to disease, tissue change, fermentation or infection are of interest in their relation to interstitial gingivitis. Many of these autointoxications are of short duration and their intensity is not lasting. On the other hand, the toxins of mercury, lead, brass, drugs, syphilis, tuberculosis, scurvy, etc., are familiar to all. They are of vital importance to the patient and physician since they act quickly, but are not of general interest at this time. The antointoxications of slow progress and in which the system is becoming slowly poisoned are the ones of vital importance and are due to intestinal fermentation and tissue changes. These toxins are taken directly into the blood vessels and carried throughout the system. This has been repeatedly proven by Bouchard.[3] Another proof of this statement is the fact that in the products of secretion of the eliminating organs, those poisons which are produced in the intestinal canal, are found.

That man was born free from microbes was first demonstrated by Metchnikoff. Soon after birth the skin and mucous membrane become infected, either from the air or water used in bathing or both. On an examination of the intestinal contents an hour after birth during warm weather, bacteria were found. Usually bacteria are not observed until from twelve to twenty hours after birth. Micrococci and bacilli flourish independent of food, since they are found in the alimentary canal before nourishment has been taken.

---

[3] Autointoxication in disease.

These microbes change in character when mother's milk or other foods are given the child. The bacillus bifidus appears with mother's milk. The colon bacillus, streptococci, staphylococci, lactic acid bacilli, etc., with cow's milk. Later changes in diet whether purely vegetable or animal, microbic flora grow rapidly in the intestinal tract. Vignas and Suckdorf have shown that an adult man passes from 30,000,000,000 to 50,000,000,000 of bacteria daily from the feces. Many, perhaps most, of these bacteria are harmless in healthy individuals. They become exceedingly virulent after accidents or injuries, such as gun shots, knife or other wounds, strangulated hernia and catarrhal conditions of the mucous membrane. Man, therefore, is in constant danger of being infected. The injury resulting from these micro-organisms from the standpoint of this paper is not from the bacteria themselves but from their toxins, the products of which are absorbed.

Autointoxication without other pathologic states is due to the absorption of toxic material due to metabolic changes and in the gastro-intestinal tract. This is assisted by hepatic insufficiency and a want of muscular tonicity to expel the accumulation.

Before considering further the putrefactive changes of the intestinal canal, I wish to speak here of a subject to which I find little of note by previous writers, namely changes in the digestive tract due to evolution. Evolution is based upon the law of economy of growth laid down by Aristotle or use and disuse of structures. It is applicable here as in other parts of the body. Man, as a whole, has undergone rapid changes and is still undergoing greater and greater specialization. In no structure of the human body are these changes so great owing to disuse as in the digestive tract. When an organ is exercised like the arm of the blacksmith, the hands of oarsmen, the legs of the mail carrier they become enlarged and strong. On the other hand, when any organ is not used, like the little muscles of the ear, the small ribs, the little toes, the blood does not flow to the part in proportion and arrest of development results. I have repeatedly shown many times, the arrest of the face, jaws and teeth in the evolution of man due to disuse. Civilization, its custom of preparing food and etiquette in eating has caused rapid degeneration of the jaws and teeth resulting in irregularities and decay. The mastication of food is a lost art with many people, the salivary glands are not excited, arrest takes place and saliva containing ptyalin is scanty. Foods cooked and swallowed without mastication are taken into the stomach without the preparation of first digestion. The gastro-intestinal juices are required to perform all the work. Changes in the liver either as to size, quantity of bile secreted or disease causes hepatic insufficiency. The same is also true of the pancreas and gastro-intestinal juices. The size of the stomach, the length and deformity of the intestine, should also be considered, and last but not least the condition of the nervous system and the power of the muscular coats of the intestines to expel the contents from the body.

The evolution of the rectum and anus from the placental and oviparous mammals is interesting but is too broad a subject to be considered in this paper. This evolution, however, in its relation to malformation and muscular tonicity must not be lost sight of in the study of gastro-intestinal irregularity.

The sedentary life due to modes of living has brought about many of these changes. The digestive apparatus has not had time to readjust itself to the new environment. Micro-organisms and pus germs which have accumulated in the mouth are taken into the stomach and intestines with every swallow. These must produce injurious results. While the function of digestion is to convert albuminoid substances into peptones, alkaloidal poisons are produced, together with toxic substances due to intestinal fermentation. These together with other poisons due to metabolic changes pass into the lymphatics and blood vessels.

Direct demonstration of this fact has been shown by many investigators. Planer after ligating the colon found H_2S in the blood of the portal vein. Carter has found indigo in animals, the subjects of intestinal derangements. Bouchard as well as Planer has observed alkaloids not only in the tissues but in the blood. Poisons form not only in the intestines but also those existing in the tissues are also observed in the urine.

That an increase in intestinal fermentation will cause a large quantity of toxic material to pass through the blood into the urine has been demonstrated many times. Stadeler in 1848 found phenol in the urine. Bauman in 1877 found phenol in fecal matter. In 1826, Tiedeman and Gmelin discovered a red colored substance in the doudenum which proved to be indol. Bracemot later found in the urine, indican derived from indol. In 1872, Jaffe injected indol under the skin and afterward found indican in the urine. Later experiments by Senator failed to find indol in the meconium or indican in the urine of newly born infants. It is an established fact today that the variation of indican in the urine is governed by the quantity of indol in the feces. In other words, the amount of indican in the urine depends upon the activity of intestinal fermentation. In cholera, typhoid fever, intestinal obstruction, Hassal, Gubler, Robin, Carter, Jaffe found large quantities of indican in the urine. Senator showed indican in the urine in constipation.

Nencki gave a dog two grains of indol by the mouth, in twenty-four hours there appeared diarrhoea. Twelve milligrams of a one per cent solution administered subcutaneously to frogs caused death. One and five-tenths to two grains of indol administered subcutaneously to a rabbit in twenty-four hours proved fatal. By similar experiments Salkowsky found phenol and cresol in the urine, especially was this the case in diarrhoea and in intestinal obstruction. There is no doubt that in future investigations, other poisons will be found in the stools and urine that produces marked poisonous effect upon the system. Putrid matter formed in the intestines found in the urine must of necessity circulate in the blood throughout the system. There is a natural fermentation going on all the time in the intestines. In young and middle aged people, when the tonicity of the excretory organs are normal and performing their office in a healthy manner, the kidneys, bowels, skin and lungs remove the poisonous products from the body. When, however, putrid matter is formed in excess or the excretory organs have lost their tonicity has the system other means of preventing the accumulation of poisons in the blood? Certainly, the liver is intended to perform that office. This has been proven by Schiff. The experiments by G. H. Roger with alcoholic extract of rotten meat show that when injected into the portal vein it is twice less toxic than when introduced into the circulation.

Bouchard has shown that blood drawn from the portal vein of a dog kills a rabbit in a dose from thirteen to sixteen cubic centimeters per kilogram, blood removed from the liver requires twenty-three centimeters. He has also shown that the injection of the extract of 2.5 grams of decomposing meat is sufficient to kill a man.

Many other experiments have been made by scientists showing similar results. In a summary of the research work, it is safe to say that the liver is intended to give protection to the system when the excretory organs are unable to perform their function.

When all conditions work in harmony, that is when animal and man after years of normal environment have adjusted themselves disease is less liable to result. When a change of environment such as food, climate and soil takes place, the animal or man becomes more susceptible to disease. Thus fifty-five monkeys die of tuberculosis in the Lincoln Park Zoo, Chicago, in one year, due to change in food and temperature, and to confinement. House dogs are more susceptible to disease than street dogs. The Indian of North America has been and is dying rapidly from change in environment and food. This is true of other primitive races throughout the world. Scandinavians in American cities are very susceptible to disease. The same is true of the negro.

Many people are still in the primitive stages as regards their digestive apparatus. They have inherited an atavistic tendency in their large well formed jaws, muscles and teeth. They masticate food and enjoy it like the carnivora, tearing and chewing meat from the bone. The digestive apparatus is perfect, the bowels, kidneys, skin and lungs do their work normally, they are in perfect health.

Many have progressed along the line of evolution where the digestive apparatus is weak. These people live a sedentary life one or two generations in advance of the tiller of the soil. They are in a transitory stage, not yet adjusted to the new environment. A third class born of neurotic parents, have inherited deformed internal organs, the secretions and action of which are not in harmony with each other. They do not chew their food and digestion is impaired. Their nervous systems may be impaired from the first or they may become involved as a result of faulty digestion and assimilation.

Studying the three classes singly it is found in the first, these pople are healthy, can eat and drink anything and at all times, day and night. They can eat eight or ten meals a day "Like the King of Portugal" and enjoy them. They can drink large quantities of alcohol or beer each day without difficulty. They are rarely ill.

When the senile stage begins, while there are no marked symptoms, the excretory organs fail to perform their work properly. Interstitial gingivitis sets in, the teeth loosen, arteriosclerosis, kidney breakdown, uremic poisoning and at from fifty-five to sixty-five death takes place from Bright's disease, diabetis, heart failure or apoplexy, the result of excesses.

The second class easily produce acute gastro-interstinal fermentation, autointoxication and are subject to sick headaches, acid stomachs, gases in both stomach and bowels, constipation. They suffer with headache, migraine and vertigo and often with nervous symptoms. In these cases, special foods will upset the entire system. Fruits, raw and cooked set up fermentation in the small intestine and putrefaction results. Coffee, chocolate, cocoa, beer and the inhalation of tobacco smoke will stop secretion of bile, produce cold extremities, sick headache in a few hours, not infrequently skin eruption is produced.

The third class is not only subject to all the symptoms of the first and second but frequently surgical operations are necessary to establish healthy relations between the digestive organs.

Deformities of the jaws and teeth are not uncommon. Macawley portrays a vivid picture of such a state in Charles the Fifth, of Spain. Among other physical deformities he says, "at length a complication of maladies completed the ruin of all his faculties. His stomach failed, nor was this strange, for in him the malformation of the jaws, characteristic of his family, was so serious that he could not masticate his food and he was in the habit of swallowing ollas and sweetmeats in the state in which they were set before him. While suffering from indigestion he was attacked by ague. Every third day his convulsive tremblings, his dejection, his fits of wandering seemed to indicate the approach of dissolution."

Prof. Russel H. Chittenden[4] in his experiments in physiological economy in nutrition has shown that excess of proteids means waste, "but of far greater importance is the unnecessary strain placed upon the body by this uncalled-for excess of food material which must be gotten rid of at the expense of energy that might better be conserved for more useful purposes."

He has conclusively shown that body equilibrium can be maintained on half of the daily intake of food. The brain worker and the muscle worker can maintain health, strength and vigor on a smaller amount of nitrogenous material than is usually consumed. "That an excess of food is in the long run detrimental to health, weakening rather than strengthening of the body and defeating the very objects aimed at." This applies to the people who have obtained their growth and not to children.

---

[4] Physiological Economy in Nutrition.

Neurotics and degenerates are very susceptible to antointoxication on account of an unstable nervous system. They become easily constipated or toxic material accumulates in the intestines by which the system becomes slowly poisoned. Convulsions occur in both children and adults. Most if not all insane patients are constipated. While it would not be safe to say that the insanity was due to the constipation yet all are greatly benefited and some slight forms are cured by keeping the bowels free from microbic infection.

Some of the best specialists claim the skin eliminates very little of the blood's poison. Under ordinary circumstances the skin excretes water, salts in small quantities, carbonic acid and in some volatile fatty acids. As age advances and the eliminating organs lose their tonicity, the bowels and kidneys fail to eliminate all the decomposed material. When these organs become diseased, the skin and lungs assist in carrying off the poisons or their products. The skin especially is important in keeping the system in a healthy condition free from poisons. The change from heat to cold and vice versa has been beautifully shown in the Spanish-American and Boer Wars, the building of railroads in high altitudes, especially in Switzerland. Soldiers and men have become poisoned from a want of quick adjustment of the eliminating organs to heat and cold together with change in foods resulting in what many physicians have called scurvy but what was, in reality, simple interstitial gingivitis.

What the laity understand as "spring fever" is but the readjusting of the eliminating organs from winter to spring. People in the senile stages feel better in warm climates than in cold, hence the custom of moving to warm climates in winter.

During pregnancy, the system of the mother is filled with poisons from maternal as well as foetal circulation. The excretory organs are overtaxed by the poisons resulting from intestinal fermentation of the mother and the cell changes in both organisms, hence the neuralgias, rheumatic pains, cramps, interstitial gingivitis and convulsions so frequently observed.

One accustomed to the odor of the skin and lungs and an examination of the mouth from interstitial gingivitis can readily detect intestinal fermentation and kidney irregularity. Many times I have detected a tendency to kidney lesions or the lesion itself in this manner which was confirmed by subsequent urinalysis.

Autointoxication in disease is familiar to all. The blood charged with effete matter or poison, due to autointoxication is abundantly proven. Oxygenation of the blood cannot be properly accomplished by nose breathing. More air is necessary, hence the unconscious opening of the mouth. A larger volume of air by nose and mouth is therefore taken into the lungs. Most people at the senile stage do this, most noticeable, however, at night.

The poisonous products of the intestinal canal not expelled from the bowels are absorbed and carried by the portal system to the liver. If sufficient bile is excreted to destroy the toxic material it will be carried back and emptied into the bowel. If, owing to some mechanical obstruction, as catarrhal swelling, gall stones, or thickening of bile, the normal function of the liver should be interfered with, hepatic insufficiency results. Any derangement of the bile or liver cells which interferes with the proper function of rendering harmful substances innocuous would cause abnormal and poisonous products to be carried in the blood. The liver, therefore, is responsible for whatever toxic material remains after it leaves the intestines.

The great outlet for poisons which the liver fails to eliminate are the emunctories, chief of which is the kidneys. If there be too much work in this direction the eliminating function is soon lost. The toxic material accumulates and results in renal inflammation and albuminuria. When this has taken place, the blood becomes charged with poisons, the heart and arteries undergo degenerative changes with cardiac hypertrophy, arteriosclerosis, the many consequent cardio-vascular diseases, insufficient blood supply to various vital organs; nervous disorders, Bright's disease, diabetes, rheumatism, gout, uric acid diathesis, skin eruptions and asthma result. Before these diseases have become of sufficient importance to be observed by the physician, interstitial gingivitis has obtained full sway. In all the above mentioned diseases, interstitial gingivitis is most pronounced.

PATHOLOGIC INFANT DENTITION.*

BY EDWIN A. GEILFUSS, D. D. S., MILWAUKEE, WISCONSIN.

The object of this paper is to call the attention of the profession to a branch of dentistry which my observation, particularly during the past three years, has led me to believe is greatly neglected, and regarding the course of procedure and method of treatment for its correction or alleviation, there seem as yet to be no well defined and generally adopted ideas, even among ourselves.

No branch of dentistry, it seems to me, is of more interest at the present time, than that involving treatment of the conditions arising from pathological first dentition. This mainly for two reasons: First, because the patient is at an age where it is impossible for it to understandingly manifest its pains and troubles, and should therefore be an object of our particular solicitude.

Second, because it has been my experience, that as a general rule the person who is usually charged with the care of the child at this age, the family physician, has either not a proper conception of conditions as they exist in the mouth at this time or else is adverse to pursuing the course and method of treatment generally advocated by the best and most advanced teachers of dentistry, that is, the deep and thorough lancing down to the erupting tooth or teeth.

The process of teething, eruption or dentition is a complicated process and is comprised of that series of vital operations, which cause the teeth to leave their crypts in the maxillae, to pierce the gum and take their place in the dental arches. It is a continuation of the process of dental development and is accompanied and succeeded by root, alveolar and maxillary developments, which should be considered with it.

---

*Read before the Southern Wisconsin Dental Society, May 30, 1906.

The consideration of the cause of eruption has developed several theories, it being evident that there are forces which can bring about the elevation of a tooth crown from its bed in the crypt to its position in the mouth. The theory most generally accepted and most satisfactory in explanation of tooth elevation is the one advanced by Constant, that the pressure of the soft tissues against the root end is derived from the normal blood pressure.

As root tissue is formed by the pulp and follicular wall lying beneath and to the side of its edges, the tooth is mechanically pushed up by the soft tissues, more root is formed and further extrusion occurs.

The root-end occupies the same level at all stages of eruption in the developing jaw that was occupied by the cervical edge of the crown. Thus at birth we find formed almost the entire of the central and lateral incisors, about three-quarters of the crown of the cuspids, and half of the crown of the first molars and a third of the crown of the second molars.

The formed crown of the tooth advances, at varying ages, depending upon the state of the tooth development, and presses upon the follicular wall overlying it; this is absorbed, the overlying tissue is reached and osteoclasts remove this as well as the upper edge of the wall of the crypt. This absorption of the roof of the crypt usually occurs at about the fifth month after birth. Then the mucous membrane is pushed up and molded over the crown, thereby causing a tumefaction.

The mucous membrane changes from normal in color to hyperaemic, and then owing to the removal of the blood by the pressure of the underlying crown, whitens. Resorption from beneath now causes a break in the continuity of the mucous membrane and the crown-tip erupts into the mouth.

In normal dentition the rate of resorption and crown advance are perfectly equalized. The crown rises from the gum, is directed by the tongue and lip or cheek, and finally meets its antagonists of the opposite jaw, the further movement of position being limited by the interlocking of cusps and meeting of occlusal surfaces.

The root development proceeds and as it occurs the alveolar process is built about the pericementum which has been drawn up from the follicular wall. By this means the roots are firmly implanted.

The first temporary teeth to erupt are usually the lower central incisors, which make their appearance at about the age of seven months. These, two months later, are followed by the upper central and lateral incisors; at twelve months the lower lateral incisors appear; first molars at twelve to fourteen months; cuspids at fourteen to twenty months, and the second molars at eighteen months to thirty-six months. All tables as to periods of eruption are, however, merely approximate and at times they would seem to be hardly that, great variations being extremely common. In fact it has been found that as a rule in this country the periods of eruption are from one-seventh, or more, earlier than the dates given.

As regards the duration of eruption, the lower central incisors take from one to ten days; upper central and lateral incisors, four to six weeks; first molars, one to two months; cuspids, two to four months, and second molars, three to five months.

Hand in hand with the development and eruption of the teeth, developmental changes occur in all the glandular appendages of the alimentary canal; probably the alterations in their structure and no doubt in their physiological chemistry are accompanied by dental provision for the mechanical subdivision of foods of post-infantile character.

Slight local disturbances are so common in even normal first dentition as to be considered physiological and natural.

The resorption about the tip of the crown of the tooth implies a condition of mild non-sceptic inflammation cognizable to the infant, the gum is of a somewhat deeper color and its temperature is elevated. Relief is often afforded by pressure, which temporarily reduces the hyperaemia, such as rubbing the gums or allowing the child to bite on hard substances which seems to please it. Biting on cold substances, such as ice, affords even more marked relief, as it causes a contraction of the dilated blood vessels in addition to mechanically lessening the blood supply.

Slight reflex disturbances are evidenced by the stimulation of the salivary glands, thereby producing an increased flow of saliva. These slight disturbances are such as to require no further attention than as cited, but when they become exaggerated, and are accompanied by nervous, alimentary, pulmonary or cutaneous disturbances, they must be looked upon as no longer physiological, but pathological, and relief should be afforded.

The primary cause of pathological dentition may be stated as an inequality in the rate of gum resorption and crown advance. The advancing crown pressing upon the gum tissue causes irritation; the hyperaemia or mild aseptic inflammation instead of remaining at a point favoring the development of giant cells and resorption, passes the physiological point and causes a disturbance of function. Inflammation either simple or infective may occur in the area.

Swelling of the gum occurs, which being distributed in all directions, presses upon the crown, depressing it upon the pulp beneath the sharp root margins, at the same time the blood pressure of the pulp tends to press the tooth upwards. The sharp edges of the root irritate the sensitive and delicate pulp tissue which becomes hyperaemic and swollen and still more strongly urges the tooth upward.

Two sources of disturbance are now possible: The irritated gum tissue and the irritated pulp tissue.

Through the intimate sympathetic relations of the fifth cranial nerve supplied to these parts, with the seventh, ninth, and tenth cranial nerves in the floor of the fourth ventricle of the brain, salivary, muscular, nervous, alimentary and pulmonary disturbances become possible.

Any systemic disturbance which lowers the nutritive function in the parts associated with the teeth, may result in local pathological phenomena, and also a hyperaesthesia of the nervous system with consequent nervous phenomena.

We may have pathological dentition occurring in the absence of an evident hyperaemic gum tissue. The tissue may be white, showing ischaemia from pressure; a binding down of the root-end upon the pulp being proven by the subsidence of symptoms after lancing and sometimes by the rapid eruption of the tooth immediately after lancing.

Pathological phenomena have been noted, too, where absolutely no superficial local disturbance of any nature was evident. In these cases the deeper tissues exert the restraining influences upon the crown.

The symptoms of pathological dentition are both local and general. The local symptoms are usually those of inflammation, red and swollen gum tissues at times assuming a dusky hue. The gums may be white, indicating their tense stretching over the crowns. Evidence of local irritability is given by the fact that the child resists the touching of the gums, seizes the breast or bottle nipple only to immediately release it. The readiness with which the child will take cold substances, ice or ice water is notable and self-explainable.

Alternate excessive flow of saliva and oral dryness may be present. In the gum over the erupting tooth there may exist a vesicular enlargement containing fluid.

In the more marked cases of local disturbances, evidences of bacterial infection of the mucous membrane of the mouth may make their appearance, as ulcerative stomatitis. As a rule the breaking down and ulceration of the tissue are confined to the parts overlying the erupting teeth, but a general stomatitis or wide scattered patches of ulceration may make their appearance.

The general symptoms may be differentiated into mild and severe. The mild symptoms are such as are attendant upon severe and painful inflammation about the face at almost any age. Thus lack of appetite, irritability, restlessness, sleeplessness, thirst, mild fever and evident desire for the upright position occur. The pain is at times paroxysmal, but may become continuous.

These symptoms subside upon the eruption of the tooth or lancing, though erupting cuspids bound by a ring of tense gum tissue, or by adjoining teeth may continue the irritation even when apparently erupted.

The more severe general symptoms are such as are brought about by reflex neuroses. The roots of the fifth cranial nerves supplied to the teeth, as has been stated, are in intimate relation with the roots of the facial, glosso pharyngeal and pneumogastric, in the floor of the fourth ventricle of the brain as well as with other cranial nerves.

It can therefore be readily understood that irritation of the peripheral ends of the fifth in the pulp tissue can produce neurotic results in the brain, salivary glands, skin, lungs or larynx, intestinal canal or muscles of the face or extremities.

Take the intestinal canal as the most complicated example: The stomach and intestines are under the influence of the pneumogastric nerve which sends to its muscular coats both stimulant and inhibitory fibres. It likewise sends vaso-motor fibres to the intestines, which when divided produce inhibition of the muscular fibres of the vessels, which leads to vasodilatation and a great increase of very watery succus entericus.

Intestinal disturbances are of course very apt to arise independently of teething. In fact, they are most liable to occur during the very period when teething may be supposed to act as a primary cause and hence it is important to differentiate. The condition may also be associated. As a rule intestinal disturbances arise from improper feeding, the food acting as an indigestible irritant to the stomach and intestines. Fermentation, due to bacteria, ensues and diarrhoea and colic are natural results; but these conditions may have their origin in teething.

The peripheral irritation of the terminals of the fifth nerve in the pulp, may through the pneumogastric, cause vasomotor dilatation in the walls of the intestines, that is, hyperaemia, a condition which favors bacterial invasion. Intestinal digestion is disordered and infection, ordinarily resisted, occurs. Diarrhoea may follow. In either case alimentation is interfered with and the general nutrition suffers. Toxic substances are generated in the intestines which cause a toxaemia to which many of the general symptoms may be attributed.

A diarrhoea due to improper feeding would not be preceded by symptoms of pathological dentition; would have a history of improper feeding and possibly of unhygienic conditions such as unsterilized milk or milk bottles, filthy surroundings, etc. In the absence of such a history and with the manifestation of pathological dentition, the diarrhea could safely be ascribed to teething. Disorders referable to the central nervous system are the most alarming and are those indicating the higher grades of severity of irritation. The milder forms are faint muscular twitchings and evidences of slight cerebral disturbance. These may be the result of poisons absorbed from the alimentary canal during the course of intestinal fermentation and as a rule are due to this cause, but as cases of even convulsions have been relieved by lancing alone, the importance of keeping the possibility of direct connection between teething and central nervous disturbance constantly before one becomes evident.

A symptom not easy to elicit on account of the age of the patient is headache. The child is sleepless and cries without apparent cause; it becomes quiet, partially from exhaustion and after a period commences sobbing. The indication of cerebral disturbance may at times be noted in the contracted pupils of the eyes and in throbbing arteries and in more severe and dangerous cases appear as convulsions.

No doubt in the majority of these cases dentition is but a secondary cause, but there is sufficient evidence that it may be a determining factor.

Laryngeal coughing, due to pulmonary irritation and otitis media have been noted attending eruption, disappearing immediately thereafter.

From this exposition of conditions as they exist at the time of teething and the complications and reflexes which may be produced thereby, due largely to the binding down of the erupting tooth or teeth, which conditions are considerably ameliorated, if not entirely relieved, by the simple operation of lancing deep down to the erupting tooth, it can readily be understood why it is the consensus of opinion among dental writers and teachers to advocate lancing wherever and whenever there is the least indication of trouble at this time of the child's life.

Even among medical writers these conditions are recognized, but for some reason or other lancing is generally decried. Holt in his work, "The Diseases of Infancy and Childhood," on the subject of "Difficult Dentition," speaks of the fact that while the list of diseases, due to difficult dentition, had from year to year been shortened, and though he had formerly held the opinion that simple dentition could not and did not produce symptoms, still he had been forced to alter his views and that he was now willing to admit that dentition might produce many reflex symptoms. In his experience he had found that only one-half of the healthy children cut their teeth without any visible symptoms.

He recognizes most of the conditions to which I have called your attention, but goes on to say that he does not believe that lancing the gums is often required although he has seen cases where it had given marked relief, especially where the gums were tense and swollen and very red with the teeth just beneath the mucous membrane.

Griffith in his "Care of the Baby," makes the statement that the cutting of teeth is not as a rule responsible for any of the ailments so commonly attributed to the process.

"Slight diarrhoea, loss of appetite, feverishness, bronchitis, some eruption of the skin and especially great restlessness, irritability or other nervous symptoms may appear shortly before a tooth is cut," he states, "and disappear with astonishing rapidity as soon as it is through the gum. Remarkable improvement will sometimes follow within a few hours, the lancing of the gum over an approaching tooth, nevertheless it is only rarely that lancing is necessary. The important point is that disordered dentition is the great exception and not the rule and that almost always it is something else than dentition which is producing the symptoms."

I am willing to concede that dentition is more generally normal than otherwise and that the more aggravated and serious symptoms are comparatively rarely met with in children otherwise healthy, and who receive proper care and attention as regards food and surroundings, still I believe that dentition is more frequently the cause of minor pathological conditions than is usually supposed and, recognizing the serious conditions which may be caused by erupting teeth, I know of no reason for not making the rule to lance in all cases where there is the least possibility or even probability of the pathological conditions manifested, being due to an erupting tooth, no matter what the stage of eruption. By lancing I do not mean scarifying the gums, but deep, thorough cutting down to the tooth.

The etiology of this condition is not the pressure of the advancing tooth against the overlying tissue, but the pressure of the jagged unformed roots, which have elongated due to their growth and have not room to advance because the tissue overlying them has not been proportionately resorbed, back upon the engorged and hypersensitive pulp. Lancing makes it possible for the tooth to advance, the pressure is relieved; pain subsides and conditions return to the normal. Consequently relief is often afforded even where the tooth is not nearly erupting.

I have cut down fully a quarter of an inch before striking the advancing tooth which was the cause of trouble. Of course the gums healed over and it was necessary to lance again at a later period.

What objection can there be to lancing?

The pain caused by the operation is entirely disproportionate to the pain and disturbance produced by the erupting tooth.

The danger from bleeding is nil and easily controlled excepting in cases where there is a family history of hemorrhagic diathesis, in which case lancing should be avoided if possible. The danger from infection is remote where ordinary care is exercised.

The claim that the formation of cicatricial tissue where the tooth does not immediately erupt after lancing increases the difficulty of penetration, when the tooth reaches this point, I do not concur in. I believe this overlying cicatricial gum tissue to be as readily resorbed by the advancing tooth as normal tissue; but even if such is not the case, what objection is there to again lancing if such a procedure seems indicated?

I can safely say that I have lanced gums over more than a hundred erupting teeth during the past three years. I have had under my constant observation during this time ten children for whose relief I have at various times operated, in some cases more than twice for the same disturbing tooth, and in not a single instance was there failure in the relief afforded.

With such an experience I feel justified in contending for the liberal practice of lancing in cases of pathological infant dentition.

ECHINACEA PURPUREA, ECHINACEA ANGUSTIFOLIA, ECHAFOLTA.

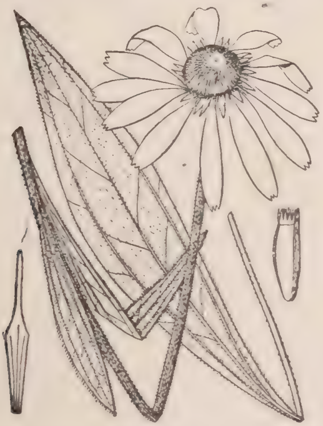
BY A. C. HEWETT, M. D., CHICAGO.

[Continued from November DENTAL REVIEW.]

Echafolta, of which I wrote in a former number of this journal, is chiefly, if not entirely, a "specific" product made by Lloyd Brothers, of Cincinnati, Ohio (Court and Plum streets). Personally we are strangers; however, to their prompt responses to my requests in writing and to their generous courtesy I am indebted for literature and facilities afforded me in the study of the very interesting plant, Echinacea.

The Echinacea Angustifolia is that from the root of which Echafolta is derived. The plant grows in the middle and southern parts of North and Northwestern states of America. In its growth of stem and blossom it somewhat resembles the Helianthus Angustifolius (small sunflowers of the pine barrens of New Jersey and the prairies of Kansas), though the sunflower is an annual plant while the Echinacea is perennial.

As historical of Echinacea I quote from Illustrated Flora of the United States and Canada, by Britton & Brown, as follows:



ECHINACEA.
(Cut reduced from Britton & Brown's "Illustrated Flora." Kindness of Lloyd Brothers.)

"Stem hispid, slender, often simple. Leaves lanceolate, oblong-lanceolate, or linear-lanceolate, acute and about equally narrowed at each end, strongly three-nerved and sometimes with an additional pair of marginal less distinct nerves, entire, the lower and basal ones slender, petiole, the upper short-petioled or sessile; heads and flowers similar to those of Echinacea Purpurea, but the rays usually shorter and narrower, often pale."

It is a plant of peculiar growth, in form as well as in medicinal properties. Its firm, slender hairy stem, its long firm lanceolate leaves, reaching out invitingly and nutritiously to the ferret, ichneumon and weasel bitten or stung by venomous reptile or insect, leaves lush with a sure antidote to the venom from fang or lance received in "battle to the death."* Drouths of summer do not wither the leaves, hispid filaments of stem, leaf, or blossom-rays. Frosts of winter can not chill the hibernating life germ within the thick black root perennially responsive to sun ray, rain fall and dew drop, in its prolonged life holding a syncretism of benisons, prophylactic and antidotal of some of the most intractible and fatal diseases of which mankind is inheritor. Whence and how this marvelous plant gathers and stores its treasure is an aporime I shall not attempt to solve.

---

*It is a curious fact, given as such by scientists, that neither animal will attack a venomous snake, tarantula or viper if shut in a room barring exit and access to Echinacea or kindred plants, while in the open where anti-venom plants grow they are always eager for the combat.

As historical of Echalfolta 'I quote freely from literature sent me by its authors:

"In the year 1897 Lloyd Brothers introduced to the medical profession† a preparation of Echinacea Angustifolia. This drug had by Dr. H. F. C. Meyers, as Meyer's Blood Purifier, a secret remedy for blood depravation and sepsis, been used with remarkable success. C. G. Lloyd identified the plant, the botanical name being published and its reputed qualities brought before the medical profession.

"The original preparation, an alcoholic tincture or extract, contained, however, as must all such percolates of a crude drug, more or less impurities, such as coloring matters, including objectionable extractive matters, including glucose and other extraneous substances, which, in many directions, served to counteract the beneficial action of the desirable proximate constituents. Especially was this the case in surgery, where such impurities could not be tolerated.

"Led thus to continue the pharmacal investigation of the drug, evolved a pharmceutical preparation carrying all the valuable proximate constituents, and entirely free from coloring matters and inert bodies. This we introduced under the name Echafolta. Echafolta is simply a purified Echinacea. It carries the full therapeutic value of the drug, minim to grain."

Practically, as student and practitioner of dentistry during the past fifty years, I have learned that in order to meet the demands made upon me professionally medicaments possessing certain properties were not only convenient but an absolute necessity. That unless I were contented to be and remain a mere mechanical oral chirurgeon, I must diagnose the nature and cause of diseased structures. When I had diagnosticated, I must either became a therapeutist, and treat the diseased conditions, or send a majority of my patrons to some physician. To do the latter was to confess ignorance and lose patronage. Pride and bread-and-butter necessity forbade me thus to confess or send.

---

†In this Lloyd Brothers were co-laborers with Prof. John King, M. D., an enthusiast concerning the remedy who introduced the preparations of Echinacea to the medical profession. The credit for the discovery of the qualities of the drug belongs, however, to Dr. Meyer, who had used it since 1870 and who freely offered them the plant for botanical identification and presentation to the medical profession. So convinced was Dr. Meyer of its efficacy in snake bite, that he urged the privilege of coming to Cincinnati and under professional care, being bitten by a rattlesnake, agreeing to stand all the expense and supply a large rattlesnake in case none could be obtained here. This offer was declined.

It was part of my good fortune to meet Prof. John M. King, and to become well and intimately acquainted with him. His endorsement of Echinacea as above related was quite sufficient to encourage me in the study and use of Echafolta. Since said study and use of Echafolta its aid with other remedies synergistic and compatible I have been able to treat successfully diseases all too frequently invading oral cavities, resultants of "blood depravation," unversally dreaded. I have been enthused quite as completely as Professor King could be. Unfortunately, however, for the success of my advocacy of Echafolta as a medicine worthy to be used and relied upon by dentists, I have only my personal experience with it and my word concerning it, to offer as evidence.

Before giving my personal experience with Echafolta, I will note some of the more common diseases of which it is palliative and curative with the names of physicians and their residences, presuming that of their knowledge concerning it they will cheerfully contribute to the inquirer:

ABSCESSES.

Dr. C. F. Gravina, New Albany, Ohio:

Abscess of the liver with open sinus during three months. Patient's strength reduced. Bed-ridden most of the time. The doctor used Echafolta three days, once daily, injected through sinus, two ounces Echafolta and water at a time. Echafolta, 2 drams; water, 4 ounces. Internally, same mixture, 1 teaspoonful thrice daily for one week. Wound healed in five weeks; cure permanent.

H. Lewis Hamilton, M. D., Colusa, Cal.:

Bruised finger; abcessed; lanced; hand held upright; pus fol-followed inter spaces to hand. Hand swollen, palm abscessed, quantities of pus discharged and sloughing commenced. Amputation advised, day appointed; another surgeon called who gave treatment for cure. Cleaned abscess with peroxide of hydrogen. Then hand covered with lint, moistened every hour with Echafolta, 2 drams, distilled water 4 ounces. Internally, Echafolta, 1 dram; Passiflora, 1 dram; distilled water, ounces 4. m. Teaspoonful every hour. Complete recovery in three weeks. Peroxide used five days. Passiflora one day.

E. J. Farnum, M. D., Chicago, Ill., says:

"In discharging tubercular abscesses, to thoroughly curette them and pack the wound with a dressing saturated with a solution of Echafolta one part and sterilized water, two to three parts, will arrest the discharge and cause a rapid repair."

He says of appendicitis: "In a number of cases of appendicitis where abscess had formed, the abscess was opened and washed out, and the cavity packed with gauze saturated with a solution of Echafolta. Although the discharges were extremely offensive and profuse at first, they entirely disappeared after three or four redressings, allowing the wound in the abdominal wall to be closed by tying the sutures that had been inserted at the time of the operation."

Dr. Farnum says of empyema: "A case of empyema of the chest in a girl ten years old, was operated upon by resecting a rib, and in irrigating the pus cavity a portion of the gangrenous lung was washed away. The stench was something terrible. A solution of Echafolta and sterilized water was used three times a day in the cavity. The offensive odor entirely disappeared in thirty-six hours, the discharge rapidly diminished, and the patient made a fair recovery."

He says of gangrene: "A case of gangrene of the upper extremity extending from the fingers to the shoulder, which was caused by tight bandaging, was treated with wet dressings of Echafolta. The gangrene was arrested; a sloughing of nearly all the skin and tissue superficial to the muscles was produced, and healthy granulations immediately sprung up. Under the treatment the gangrenous odor was reduced to a minimum."

Puerperal Sepsis: "During the late winter and early spring, I treated the above case in a woman aged 37. The tumor grew so large and caused so much pain that she miscarried about the fourth month. After counsel with a local physician and another from Chicago, we decided it to be cancer and advised an operation, but in spite of curetting and local treatment she developed sepsis. I put her on teaspoonful doses of Echafolta (this dose from former experience). When I would decrease the dose she would grow rapidly worse, althought the local treatment was kept up just the same with Echafolta and Cactus. She made a good recovery and the tumor disappeared. Of course, we were mistaken as to its being cancer, I presume, but I am very enthusiastic with Echafolta, as this is the fourth case of sepsis I have treated with it, and a great many with running sores, eczematous legs, etc.—J. C. Mollyneaux, M. D., Woodland, Ill.

I have selected the reports of the foregoing cases showing value of Echafolta in diseased conditions. Dentists have to deal with results of depraved blood as often in their practive as do surgeons and physicians in theirs.

It were unfair to the intelligence of the up-to-date readers to argue that a remedy reliable for one might be for the other I might quote from literature I have gathered, matter just as germane and convincing as that already given sufficient to more than fill the pages of this number of the Review. I shall ,however, content myself by naming diseases treated with Echafolta, together with name and address—a few cases only.

Blood Poisoning.—H. Lewis Hamilton, M. D., Colusa, Cal. Margaretha Eilkenloh, M. D., 738 Division street, Chicago, Ill.

Exophthalmic Goitre, 13½ inches in circumference. Injections (hypodermic) into body of tumor, six in all. Tumor entirely disappeared.

Boils.—J. D. Dawson, M. D., Smithville, Ark.

Boils and Carbuncles.—John C. Ross, M. D., Portland, Ind.

Dry and Senile Gangrene.—J. W. Van Osdel, M. D., Allensville, Ind.

Phlegmasia Dolins.—B. Myer, M. D., Dutch Flat, Cal.

Puerperal Septicemia.—R. L. Chase, M. D., Edmonds, Wash.

Sepsis from Vaccination.—J. R. Struble, M. D., 878 Hancock avenue, Chicago, Ill.

Septic Conditions.—Secundines retained following abortion. R. L. Brown, M. D., Oskaloosa, Iowa.

Sepsis From Dog Bite.—B. F. Severns, M. D., Anderson, Ind.

Septicaemia.—Amputated Toe. W. E. Daniels, M. D., Madison, S. D.

Old Sore Leg (fourteen years' standing).—Editorial *American Medical Journal.*

Snake Bites and Insect Stings.—T. J. Daniel, M. D., Magazine, Ark.

Spider Bite.—John G. Ross, M. D., Portland, Ind.

Rhus Poisoning and Prophylaxis of the Same.—Walter Fearn, M. D., San Francisco, Cal.

Syphilis.—Editorial *The American Medical Journal.*

Scarlet Fever and Sequelæ: Ulcerative Tonsilitis and Typhoid Fever.—J. A. Swen, M. D., Henry, Ill. J. D. Dawson, M. D., Smithville, Ark.

Ulcerative Stomatitis.—E. Lemming, M. D., Waldron, Ark. R. L. Chase, M. D., Edmonds, Wash.

Ulcers (Varicose).—M. V. B. McKinney, M. D., Kalamazoo, Mich.

Wounded Finger (pin prick, hand and arm swollen enormously and discolored. Temperature, 103. One prescription cured patient). —G. Lewis Hamilton, M. D., Colusa, Cal.

Blood Poisoning.—Case in which I took a deep interest.

Mr. F., aged about 50 years, attacked with ranula. The tumor became swollen and troublesome. He applied to a physician who lanced the cyst. A septic lance or some other banal influence, brought on blood poisoning. The second day after lancing the tongue became swollen, the left arm paralyzed, the left muscles of the face drawn and fever developed. He came to my home, stumbled to a lounge, and said, "You must treat me." He rapidly grew delirious, and feverish (temperature 104°), his tongue protruded, and altogether his case was anything but promising.

I prepared Echafolta, drams two, water ounces four, gave teaspoonful every fifteen minutes for the first hour, every thirty minutes for second hour, and thereafter a teaspoonful every hour. To the swollen and black ranula under the tongue, I applied the mixture frequently with probang of absorbent cotton. Thirst called for water and in each draught we put a few drops of the Echafolta full strength.

He took medicines and drinks with great difficulty. Delirium continued the greater part of the night, but near morning he became rational, his tongue receded within the mouth, spasm of facial muscles relaxed, and at day break a general perspiration gave hope and encouragment. During the day convalescence commenced, and a speedy cure followed. Teaspoonful doses of said dilution were continued for several weeks four times daily. He still lives and avers: "Echafolta saved my life." I am as confident as he is of the correctness of the averment. I used no other remedy except the water he drank till the fever was broken. I, without the Echafolta, should have refused to care for him except as a nurse under some other one's direction.

ANOTHER CASE IN WHICH I HAD SOME EXPERIENCE.

Gangrene and Septicaemia.—Nearly ten months since, one morning I "barked" the shin of my right leg through trouser and drawer leg. I thought little of it; did not even look at the bruise first day. I had an engagement to give an address at Toledo, Ohio. I filled my appointment, but neglected my bruise. By the time of my return, when I consulted my physician, Dr. J. E. Gilman, he comforted me by saying, "Go home, put your foot on the mantel and attended strictly to business caring for your leg."

Inflammation had sped its course. Gangrene had fairly developed. The dead surface was 7 by 3 inches. In depth it was from dermal surface to the bone and involved periosteum and bone surface to a thickness of about one millimeter. The exfoliated slab of bone was fully that thick when stripped off.

I have no desire to display a picture of the wound, but wish to show a condition. Fully a half pound of skin, flesh-tissue and bone had become gangrened, and must be gotten rid of by surgery, or mummification and exfoliation. The surgical and medical opinion obtained was that I would not survive an operation. So the latter course was chosen. Blood poison developed. I took Echafolta faithfully and held that scourge in check.

Ichthyol and dessicated allumin were used to "mummify" the gangrenous mass. To hold inflammation in check and neutralize toxic influences of the rotting flesh and bone, and purulent exudates, and soothe the pain, Echafolta and cocaine were used. The following is the formula:

℞ Specific Echafolta .... ʒij
Aqua Pur. qs. ad...................... ℥iv
Cocaine, grs., xxxviij.
M. Sig.—Apply with lint compresses kept moist.

Internally Echafolta two drams to four ounces of water was taken one to two teaspoonfuls every four hours.

Dr. Gilman paid marked attention to "tissue building," heart action, and to vigorous working of the pancreas. Fortunately he holds rank as nestor of medical and surgical practice, college teacher and hospital worker in Chicago, and in the central Northwest. I say this not to laud him. He needs no praise. But he has permitted me to quote him as an earnest advocate and endorser of Echafolta. He believes as I do, that without it my life could not have been prolonged.

As I had written the above last paragraph Dr. Gilman came in to see me professionally (I am still under his care), and I told him I had given his endorsement of Echafolta. He responded, "That is correct. Give me some paper and I'll write you a case." I did so and the following resulted. He volunteered also to append the remarkable statement, for such it is in view of his celebrity abroad as well as at home:

CASE OF BLOOD POISONING.

Mr. C., aged about 50, was bitten by a cat through the tissues of the hand between the thumb and first finger. This healed promptly, but five or six mornings after Mr. C. woke up with a painful hand. By night the hand was swollen to double its normal size, exquisitely painful with the reddened streaks of inflamed influx, lymph, etc., formed in the wrist and forearm. Temperature, 104½. I applied Echafolta, Ol. Ricinus, equal parts locally, keeping the hand saturated and internally gave Echafolta in water, four teaspoonfuls daily. When the hand was extremely painful a 4 per cent application of cocaine was used, but was applied but two or three times, as the Echafolta liniment served to control the pain wonderfully. In two days the case was discharged as cured and the hand after exfoliation of the skin is perfect in every respect.

After a very considerable experience with Echafolta I consider it as great an addition to the materia medica as opium or quinine. Its power over septic conditions gives us a complete control of cases of blood poisoning and materially relieves us of anxiety in all septic diseases or conditions. (Signed) GILMAN.

FOR DENTAL USES.

Every dentist should have a four-ounce bottle of Echafolta in his office and another one for his home if he has one. The cost of each should not exceed fifty cents.

Do you shave yourself and "grain" your chin? *Echafolta.* Is your razor a pet and do you wish it surgically clean and free from rust? *Echafolta.*

Do you seek the best measures of keeping burs, excavators, drills, forceps, blades and searchers "clean"? *Echafolta.*

Do you wish to treat and cure "really truly" Riggs disease, or spongy gums, "canker" sores, or ranula? *Echafolta.*

Do you suspect "syphilitic taint"? *Echafolta.* If you are to open a blackened tooth with an "ancient" dead and dried pulp and you fear "volcanic eruption." *Echafolta.* A pulp chamber to open, root canal to fill, crown or bridge to set? *Echafolta.*

Long before you have found bottom of first package few will be the days in which the bottle will not be jostled, dipped-into and blessed.

Echafolta *alone* for all this? By no means. You need all the helps available; and there are adjuvants of inestimable value. Beefsteak is good, very good, but none of us eat it to the exclusion of other foods.

I will, in closing this already too long article, give formula and suggestions that I have found of great value, combining a few simples to meet combining symptoms.

If bitten by an animal, rabid or benign, Echafolta alone full strength at first to wound. The same if wounded by pin, needle, scalpel or rusty nail.

If swelling and pain supervenes after twelve hours, compress of lint kept wet with Echafolta ¼ to ½ per cent dilution.

If rabies or venom is possible Echafolta one part to four of water; circle wound with four to six hypodermics; thrusts as deep as wound if practicable, subdermal, of course, and wet compress.

If tetanus is feared Echafolta and castor oil, equal parts, on lint covering wound. In either case internally ℞ Echafolta ʒij, water ℥4. If danger imminent teaspoonful every fifteen minutes first hour. The same every half hour the second hour, and the same every fourth hour till four ounces are given, and a couple of drops Echafolta (full strength) with each drink of water.

In case of malignant carbuncle circle tumor one inch from base with hypodermics of Echafolta ¼, water ¾. Cover tumor with compress, Echafolta full strength. Internally, Echafolta diluted as suggested for animal and dissection wounds.

Before giving hypodermics be human and give patient chloroform smelled from open mouthed bottle until analgesia supervenes.

For diphtheria maligna, Echafolta. Membranous croup, Echafolta. Band throat and neck with flannel moistened and kept wet with ℞ Echafolta one part, water two parts. Spray throat once an hour with ℞ Echafolta one part, water five parts. Internally, ℞ Echafolta ʒij, water ℥iv. M. Sig. As for grave cases of blood poisoning.

If hypodermics of antitoxin must be used, select the vegetable instead of animal. Echafolta, one part, water ten parts. Set the animal product aside until patient recovers. Then perhaps his heart can beat on in spite of it.

For all sore throats, aphonia and singers' hoarseness, Echafolta.

I make explicit suggestions "For Dental Uses," because as a dental specialist I have had practical experiences in all cases named except in wounds venomous. I never treated a "snake bite." Concerning stings of insects, poisoning by rhus tox, and nibblings of the Agile Pulex and nocturnal visitations of Mr. and Mrs. Cimex Lectularius I have knowledge.

It will doubtless seem akin to the miraculous that so minute a quantity of Echafolta as advised can produce such amazing results. But the two facts admitted, first, that Echafolta is compatible with water in all proportions, and, second, that it is non-toxic in all doses, and non-irritant, a fair inference is the drug can pass the sentinels at mouths of the absorbents freely, thence to mingle in the aqueous contests of the blood, battle with the proliferating Schizomycetes said to be causative of or attendant upon blood depravation.

Echafolta seizes upon and appropriates morphine, atropin, strophanthin, lupulin and cocaine, bringing out and intensifying their therapeutic potencies.

The following formulæ I have found useful not only, but elegant for compatibility, permanence and convenience. It is with pleasure I present them to the profession:

℞	Echafolta (Lloyd's Sp.)	ʒij
	Glycerin (Pur) gtt.	xv
	Mur. Cocaine (C. Crys.), grs.	xxxviij
	Aq. Dist., qs. ad	℥iv

M. Sig.—As a colyrium, two drops in each eye thrice daily.

For hay fever, sneezing and "cold in the head," spray nose four times daily. For chafing, ecthyma, bruises and "bites" or stings. Allays itching of eczema.

℞	No. 1. Echafolta (Lloyd's)	ʒij
	Oil of Cloves Pur.	ʒij
	Spec. Cactus Gran.	ʒij
	Acid Carb. (Crystal), grs.	xx
	Mur. Cocaine, grs.	v
	Glycerine Pur., qs. ad	℥j

M. Sig.—Ten drops on toothbrush as gingivarium or applied with probang.

No. 1 is "above price" as stomachic, 10 to 20 drops on sugar after course dinners, and for "sour stomachs" thrice daily, after meals.

The latter I especially commend, not because it is my formula, but because *"it is good."*

As a stomachic taken after meals (10 to 20 drops on sugar) and repeated in two hours if acidity resists first dose, it is priceless. Microzymes can not proliferate in anesthetics of Echafolta, oil of cloves, carbolic acid and sedative of cactus, to say nothing of the 1 per cent of cocaine, in itself anti-microbic, and a splendid tonic.

The superlative of value is reached when (and only when) 96 grains of cocaine to the ounce of mixture is used, instead of 5 grains. This nearly saturated solution is the true gingivarium to be applied *only by the dentist*—never "bottled out" to patients. Danger? Yes, if taken into the stomach; not otherwise. Though a potent mixture, it is safe in wise hands. This message is to educated, care-taking men.

I used it for years in mouths of children and adults without one untoward result.

Its use wherever there is pain, pus or pockets, or where there is pyogenetic tendency either in pocket, pulp-chamber canal or apex, antrum or sinus. It is not a hypodermic, but a curved hypodermic needle ground to a smooth round nozzle is a convenience in carrying drop doses to pocket or place. If after filling a root canal ulceration threatens, a pledget of cotton be wet with it and placed between cheek or lip and apex of root, left there a half hour, and ten-drop doses of low potency gingivarium swallowed bi-hourly, it will abort the ulcer. Epithelium will desquamate but healing will be kindly and ready. With high potency gingivarium applied to an aching tooth and gums surrounding, pain can always be relieved.

If ℞ is carefully compounded from pure liquids and clean crystals, the product will be permanently clear, without a particle of sediment, flocculence or spume. So certain may you be of this if your druggist gives you a cloudy muddy mess go to (or for) him with a "heart to heart" suggestion.

Rose petals dried in the shade enclosed in a roomy paper bag (shaken often) when dried shredded finely with scissors, put for twenty-four hours in Echafolta will give an extract containing perfume, tannin, oil, mucilage and gluten;—1. of Ext. 2 of water a beauty lotion beyond compare. The shredded leaves thus moist, give an emulsion which for antiphlogistic, antiseptic, and antikamnia, potency challenges belief till a "bite," "bruise," or "beal" borne by some victim thus treated silences doubt. The perfume of the rose is anesthetic like all other delicate agreeable odors.

SOME NEEDS OF DENTAL SOCIETIES AND THEIR MEMBERS.*

BY J. F. M'CREA, D. D. S., MINNEAPOLIS, MINN.

Members of the Minnesota State Dental Association:

Ladies and Gentlemen.—Greeting. Again, and for the twenty-third time, we are convened for self-edification. In watching the clinics listening to essays, and the discussion of papers of our program, which is so full of instructive and useful matter to the members and visitors, I feel assured that all with one accord, will say they have been benefitted, and will go away from this meeting better equipped to combat the difficult questions of daily practice.

---

*President's address read before the Minnesota State Dental Association, June, 1906.

I will take this opportunity—as I stand at the close of my official term—to thank the members of this Association for the confidence reposed in me, in placing me in the highest office within their power. Whatever has been accomplished, you are the judges; much or little, it has not been by the effort of myself alone, but of an able corps of assistants, more worthy of your plaudits.

It has been a year of pleasure to be able to assist in getting together a program such as you have awaiting you. I desire to thank the profession of the state and of the northwest in particular, for the voluntary co-operation, and especially those of you who have so willingly contributed of your time and labor to the success of this meeting.

Such meetings are only had at the expense of great energy and time of those taking part, therefore, I wish to emphasize that to them belong the honor, and as presiding officer of this Association, I am grateful to all taking part, especially those coming from a distance.

In casting about for a theme, I found none specific enough for exclusive consideration, therefore, I decided upon "Some needs of societies and their members."

The late Dr. Barrett once said, "We all agree that societies are more potent for the elevation of our beloved profession than any other known means." This is still true, but societies—like individuals or captains of industry—must be aggressive. We find that is the condition of our society. Within the past year we have progressed by increase in membership, an enlarged sphere, broadened ideas and more concerted action. Notwithstanding all this, there is urgent need of continued and uninterrupted progress.

An eminent author once said, "The pride of a man in his work, whatever be the character of that work, is all that makes labor endurable in this world of toil and anguish. It is certainly a redeeming fact that this pride comes to one as a solace, as a defense against the ennui of a purposeless life, as a justification for the continuance of a life aparently useless, as an inspiration for a useful and beneficient life." After such beautiful thoughts it seems we ought to be inspired to grander ideals and more noble purposes.

"Putting your shoulder to the wheel makes progress. Many shoulders to the wheel makes much progress. Let us all resolve that our shoulders shall do their duty. Let us steer between the two strands of wearing out and rusting out, then will we be sure of holding out."

A visionary prophet would he be indeed who would predict the dentistry of fifty years hence. Look back a half century and see the hopeless task it would have been to have painted the picture of today.

The successful dentist of the future must be an educated and polished gentleman, in addition to being a master of his profession. "The lady of the future will select with jealous care the dentist who guards from harm her oral case of jewels rare."

The Archimedian lever that will elevate honest effort and ability, is the reduction of the amount of work we do and a corresponding increase of the fees.

We herald to our aid all the modern appliances and methods, accepting the few and rejecting the many, and yet ideal dentistry will only be universally practiced when all other good things for man's advancement are apace with it; an appreciative public demanding it can alone produce it.

It has been recently argued that we are on the wrong road, that our studies have been confined to conditions and symptoms, and very few have been interested in the cause of disease, or the theory of decay, while all have been interested in the cure. Will our present knowledge of the etiology of caries and other diseases incident to the oral cavity, or our comprehension of antiseptics and their application, ever be so thorough as to promise immunity from the troubles which we are called upon to combat daily, thus rendering the services of the dentist almost useless? If we can not have this immunity from disease, can we ever hope to have that, which up to the present has eluded the investigation of the scientist and inventor? I refer to the ideal filling material.

For purposes of original investigation and research, it is proposed to have instituted, either in connection with organized societies or as a part of our dental colleges, laboratories in which an expert bacteriologist and scientist shall be employed for research work exclusively. I would most heartily recommend this plan. Through this means it is very probable that the pathology of the diseases of the gingival margin may be known and their cure effected. Thus may be found ways and means—both surgical and medicinal, whereby the great loss of teeth by these causes (pyorrhea alveolaris) can be arrested.

The need for original investigation is very great, indeed, it can not be overestimated, and the men to do it—if practical results are to follow—must be those of us in active practice. It is only they who know to the fullest extent the needs of the profession, or can prove by the most intelligent tests whether these needs have been met.

Prophylaxis, or that force tending to establish immunity from decay in the oral cavity, should be better understood, in order that prevention should be the order rather than repair. (This we expect will be an important part of our present program.)

Following up this line of thought, there is not one of you who would not readily admit that an obtundent of sensitive dentine would be the greatest boon to us and our patients. I mean an obtundent in the fullest sense. We have them in an abundance already, but none sufficiently universal, nor of sufficient ease of application.

Another need of hardly less importance is a prophylactic or wash for the oral cavity; something that will prevent decay and its recurrence. I mean one that after reasonable mechanical care had been given the teeth, then by the use of this wash the teeth might be rendered immune for a reasonable time, say twelve hours. And yet Dr. W. D. Miller, in a discussion on his last article entitled, "Symbiosis," in the May *Cosmos,* says: "It has been shown, however, that it is possible to save the life of an animal infected with tetanus by injecting streptococci, and if we could find a micro-organism which would grow in the mouth and would be sufficiently vigorous to exterminate the acid-producer in the struggle for existence, we might be able in this way to effectually restrict the ravages of decay. There is, however, little hope of finding such a micro-organism, for if there were one it would probably have found its way into the human mouth long ago." He concludes his discussion by saying: "It is a question well worth our careful study, whether immunity to caries is not the result of antagonism between different kinds of bacteria in the mouth."

So, you see one of the most eminent men of our profession admits of a question as regards immunity from caries. This, and many other questions might be solved by our laboratory. Our needs are almost innumerable, but I shall dwell on only two or three at length, and just mention a few others.

We need better steel in our instruments, and better plating of nickel thereon; better porcelain for our teeth and our inlay work, and a better cement for holding our inlays in position. And especially do we need a better cement for filling materials. It is this form of material that holds out the greatest hope of ultimately becoming the ideal filling material.

Our dental laws need to be guarded more securely, and I would suggest that in the future a very strong standing committee be appointed in order to effectually safeguard the molestation of our state dental laws, against the petty whims of a few so-called influential legislators of each succeeding legislature. It is often the case that these so-called influential servants are willing to sacrifice the entire fabric of our dental law, which guard the best interests of over eight hundred dentists, for an individual, if he chance to be his friend.

There is urgent need for a change in the constitution and by-laws of our association, giving us something more flexible and more in accord with the workings of the most advanced modern dental societies of the country. We have a strong committee working on this, and its chairman, Dr. Owre, no doubt will give us something good—the result of his wide experience.

We need greater membership, in order that we be more representative, and can wield greater power in everything pertaining to dentistry. Membership in dental societies has been classed as a professional duty. It is that and more—it is a professional privilege. We have a very efficient committee on membership, under the guidance of its chairman, Dr. Yaeger, who did such admirable work for us last year in adding to our membership, that we can undoubtedly expect more this year.

I might mention last but not least, that we need better fees. We are all woefully underpaid. If we adopt half of the good things we see and hear yearly, at meetings, we are adding materially to our capital, and as such—like any other of our investments—it should augment our income in just the same proportion. How many of us, on the other hand, continue from year to year, exacting the same set fee for similar operations? Our patrons must be educated to the fact, that as we get richer mentally, and in skill, that our annual income, in dividends therefrom, should be correspondingly augmented.

We need some definite step taken at this meeting, whereby we may fittingly celebrate our quarter-centennial two years hence. I recommend that some action be taken either by appointment of committee or otherwise that we may have the biggest and best meeting ever held in the northwest, in honor of the event.

Now, in conclusion, I want to thank the profession generally, and those of you taking part in the program, in particular, especially those from abroad, for the sacrifice you have made in preparation for this meeting.

Again, I wish to thank the members of the Association for the honor conferred in my elevation to the presidency, and hope I have discharged my duties to the best interests of all concerned, and that I may be of some use to the profession in the future. I only ask that you accord me your forbearance and assistance in the discharge of my official duties to this Association until the close of this session.

CARE OF THE EYES AND EYESIGHT BY MEMBERS OF THE DENTAL PROFESSION.*

BY CASEY A. WOOD, M. D., D. C. L.,
PROFESSOR OF OPHTHALMOLOGY IN NORTHWESTERN UNIVERSITY.

There are several reasons why the oculist should feel entirely at home in a meeting of dentists. In the first instance, both are departments of medicine belonging to the earliest of the surgical specialties. During the rather long period in which we have had a separate existence we have witnessed the rise, the fruition, and, in some instances, the fall of many so-called specialties that began with much promise but are today once more merged in general surgical work. The dentist and the oculist appear to have survived these changes and still hold their own particular ground. I have no doubt that one reason for this is the peculiar requirements and special preparation necessary to succeed in the work that we both have to do. The special training of the senses that is involved in the work of the ophthalmologist and the dental surgeon render it difficult for most of us to practice successfully more than a single branch, whereas the general surgeon may or may not undertake all, or nearly all, the other surgical specialties.

---

*Read before the Odontological Society of Chicago, April 10, 1906.

It is for these reasons that in addressing you tonight I feel that I am talking to men who practice a specialty akin to my own.

I need not draw your attention to the fact that dental practice involves the use of the eyes to an extent entirely unlike that of most other professions and industries. From this standpoint the population might divided into three classes. Among the first class are those who use their eyes constantly, or nearly constantly, for looking off in the distance. An example of this class one finds in the farmer, the engineman, the land surveyor, the sailor, etc.

Second, the class that uses the ocular apparatus about one-half the time for looking off in the distance and the other half for rather constant, close work.

Third, the class to which the great majority of the members of the dental profession, in common with bookkeepers, watchmakers, stenographers, compositors, etc., belong.

I might add that probably the great majority of workers in the large cities form part of the third class; indeed, it is very difficult in modern times to find urban work for a man or woman that does not involve almost constant use of the eyes for near work. I fancy we shall arrive at a better idea of the character and consequences of this work if we remember that each eye-ball is a sort of camera, and every time one looks close at hand he, in a certain way, strains his eyes. This strain is an abnormal one because there is really no adequate arrangement in the normal eye for continued accommodation for near objects. It is quite true that the focusing apparatus is much more perfect in man than in any of the lower animals, but fixation for near is an act that has to be learned by the child: the ability to perform it was not born with him. Moreover, to do it well requires practice for a number of years. You all know that the infant is incapable of binocular vision, that is to say, single vision with two eyes is not accomplished by most children until the third month, in some cases not until the sixth month, and occasionally not until the child is a year old. Again, if one is far-sighted or astigmatic (and most of us present one or both of these forms of refraction) the attempt to see distinctly with both eyes at close range is still more productive of eye strain.

With this incomplete introduction of the subject let me say that I would like to divide it into two or three categories. First of all, I should like to speak of the *student of dentistry.* Like other students or, perhaps, more than other students, it is necessary that he should do near work all day long. When he is not reading text books or writing lecture notes, or doing microscopical or bacteriological work, he is examining minutely the mouth and teeth of patients. Consequently the fact that strikes me as important in the case of a dental student is that he should begin his college work with a good pair of eyes. If he is far-sighted or astigmatic or has any other defect that can be cured or relieved, attention should be given to his eyes early in his studies. If he has an incurable disease of the eye, or has a defect that makes it impossible to use his eyes for long periods, then I would strongly advise him to abandon or never attempt the study of dentistry. I not infrequently have as a patient a dental student complaining of headaches or pains in the eyes or defective vision, because of an undetected error of refraction or an eye-muscle defect that has not been remedied. Still more unfortunate is it to be consulted by a dental student who has had a complete breakdown in attempting to use his diseased or defective eyes for continuous near work. A short time ago I examined a second year student who, while he had normal vision with one eye, had very defective sight in the other. In the weaker eye there was a congenital condition which made it impossible for him to have binocular vision. He complained after working, either with a patient in the dental chair or reading much at night time that his head commenced to ache and that objects in front of him became blurred or indistinct. I advised him very positively not to persevere in his studies, or at least to undertake some department of practice that would not involve the continuous use of his eyes for near work.

Let me repeat that before the dental student is allowed to undertake the arduous curriculum (as a preliminary to still more exacting use of his eyes) that he should have his whole ocular apparatus carefully examined.

Let us consider now the *dentist,* after he has received his diploma and settles down for the practice of his profession. Assuming that his eyes are in the best condition possible for the work which he will find it necessary to do, I regard the *illumination* by the aid of which he expects to do his work, probably the most important consideration. It may be stated at the outset that *natural light of the diffused variety,* that is, not direct sunlight, is the best form of illumination for the dentist's work. When there is any choice in the matter artificial light should never be employed for the difficult work that the dentist's eyes are called upon to do. Should it be necessary to use artificial light, the modified electric light, or, better still, gas, is preferable. Of course, these considerations will not be appreciated by men with good, strong eye muscles, normal eyes (eye-balls that are neither too far-sighted or astigmatic), a stable nervous system and a good digestive apparatus, or who are under forty years of age. As soon as any of these factors are lacking then will the dentist know what is meant by a poor illumination. The old rule laid down by Magnus obtains with peculiar force in the practice of dentistry, namely, that in all near work especially the *illumination should neither be too strong nor too weak; it should imitate as nearly as possible diffused sunlight, and it should always shine upon the work to be done and never, either directly or by reflection, into the eyes of the operator.* I have noticed in a number of dental offices that a strong light is thrown into the mouth of the patient as well as into the eyes of the dentist. This is one of the worst mistakes that can possibly be made by any man doing continuous close work. While it is quite proper to have an effective light falling upon one's work, the eyes of the operator should be in comparative darkness. If the near-worker is to preserve his eyesight until old age he should not abuse his eyes by neglecting this rule. There is no question but that, especially after 40 years of age, the man who misuses his eyes in this way is more liable to cataract, disease of the choroid and retina and to a sort of dulling of sight due to degeneration of the optic fibres.

The *use of glasses* is an important matter to the dentist. We often hear a man boast of his good *distant* vision. Time and time again one listens to people telling of their capacity to see a church clock three miles away when other people are unable to distinguish its outlines. These as a rule are people who are far-sighted, i. e., those who at, say, 25 years of age, possess unusually good vision for the distance. It so happens, however, that it is the worst possible kind of sight that a man can have if he is obliged all day long to do near work. The fact is that a slight degree of nearsightedness (myopia) is much preferable than any form of far-sightedness. The dentist's work lies within a range of a meter or two; he is rarely interested in anything more than twenty feet away, and his vision should be adapted to these conditions. If, therefore, he has an appreciable amount of far-sightedness it ought to be neutralized by means of appropriate glasses. The same thing is true of astigmatism (a deviation from the normal shape of the eye-ball) and is particularly true of astigmatism combined with hypermetropia or other curable defect. These glasses, in the majority of cases, might be called "operating" glasses, and inasmuch as they enable the eye to see close at hand with the least amount of strain, might in the majority of cases, be used only while work is being done.

In this connection there is an old superstition that if you put on glasses early you will not be able to do without them and that something dreadful will happen in consequence of this "slavery to habit." There never was a more mistaken idea, because no man by merely "taking thought" can really cure a defect due to an abnormal shape or a deviation from the normal shape and size of the eye-ball. The *early* use of glasses is of much use to the far-sighted individual who persists in using his eyes much for near work.

There is another well recognized rule that will enable most people to decide whether they need glasses for their near work. When an individual finds that he can not, at ten inches in front of him read, in a dim light, "diamond" print with each eye separately, he ought to have glasses to assist him in his work. Nothing is to be gained by waiting, because the eye is being strained in the meantime. Of course, if one will give up near work and live an outdoor life for nine months out of the year, glasses of this description are not necessary and would be entirely superfluous, but when the dentist, the oculist, bookkeeper, stenographer, *et hoc genus omne* persist in working all day long for eleven months out of the year, special arrangements are generally necessary for such abuse of the eye.

The man who persists in using his eyes for the great majority of the working hours at close range, can not afford to further abuse them by reading badly printed newspapers with a poor light, or to read on railway trains and street cars (as most of us do) or do much reading while lying down. I do not say that reading for half an hour in a prone position makes any great difference with the average individual, but this habit indulged in for several hours at a time increases the congestion of the interior of the eye, and sooner or later produces changes in the eye itself.

Finally, one of the exciting causes of eye strain, especially in students, is too long hours and lack of recreation. I mean lack of that particular form of recreation that gives the eye a rest. From an ocular standpoint it is a great mistake to work in a down town office all day and then take recreation by going home to read a book or magazine. Far better to emulate the example of your chairman by an excursion into the woods or by taking a fishing excursion, or, in winter, going for long walks. Choose one of these forms of recreation as an investment. Do it because you feel that you owe it to your eyes. You use your eyes more in doing your daily work than you do any other organ of the body. Possibly we are all obliged tc do a great deal of talking, but the tongue does not suffer from tongue-strain as the eyes do from eye-strain. If you will give your eyes a chance to recuperate you will subsequently do better work, and, possibly, just as much work as if you had tired them out in the operating chair for a few hours longer. You ought then to neutralize any possible damage to your eyes by taking pleasureable excursions. Such a course will calm your nervous system, act as a tonic to your muscles, increase your digestive power and thus indirectly furnish you with more competent eyesight.

I need hardly suggest to gentlemen in your profession that the moment any eye symptom or eye defect is noticed you should at once repair to the oculist for counsel. Nobody knows better than the dentist how people neglect their teeth but, on the other hand, it is possible to be fitted with artificial organs of that variety. We may purchase new teeth, but we can not purchase new eyes. A short time ago there came to me a dentist from a neighboring town who had a very good practice, and whose history was one of defiance of every law of health, general and ocular. He began his college life with poor eyes and suffered from eye-strain, headaches, inflammatory signs of ocular disease, and so on. Now, at an early age, he has developed cataract in both eyes (as the result of chronic choroiditis) due to nothing more or less than a downright abuse of his eyes and nervous system. He at first thought the choroidal disease was a temporary, unimportant trouble and did nothing for it. I am sure that the disease itself and the consequent cataract might have been prevented and that he might still be pursuing his hitherto successful career, if he had paid ordinary attention to his general health and to the condition of his eyes.

PROCEEDINGS OF SOCIETIES.

THE THIRTY-THIRD ANNUAL MEETING OF THE AMERICAN DENTAL SOCIETY OF EUROPE, BERLIN, GERMANY, AUGUST 1 TO 4, 1906.

After the president's address Prof. W. D. Miller read a paper on "The Treatment of Sensitive Dentine, with Special Reference to the Production of Anesthesia by Pressure."

Professor Miller then exhibited a series of slides showing his methods of investigation and comparisons between penetration with a watery solution and solutions of glycerine and formalin, etc. He also exhibited slides illustrating his experiments with pressure anesthesia. At the conclusion of his demonstration, Professor Miller exhibited a series of preparations showing the beautiful effects obtained by staining sections of the teeth of different animals.

DR. W. HIRSCHFELD

Asked Professor Miller what he would recommend for local anesthesia for the purpose of excavating a very sensitive cavity at the neck.

PROFESSOR MILLER

Said he should probably treat such a cavity, if extremely sensitive, with nitrate of silver, cover with Fletcher's artificial dentine (Hyposulphate of zinc) and give the patient a sitting two or three days later.

DOCTOR HIRSCHFELD

Asked whether he would not prefer the local pressure after the system of Doctor Meyer.

PROFESSOR MILLER

Was unable to say. He would prefer it if he knew there would be no injury to the pulp, but at present he was in doubt as to that point.

Boring the pit to insert the nozzle was rather a painful operation unless it was bored outside the cavity.

DR. G. NORTHCROFT

Asked whether Professor Miller had experimented with a preparation of paraform at all.

PROFESSOR MILLER

Said he had not.

DR. F. A. AGUILAR

Said the question treated by Doctor Miller was of such importance that he should not like the occasion to go by without calling his attention to a medicament he had brought before the Society two years ago and which he had continued using for the treatment of sensitive dentine with excellent results, nervocidine. He had used it in the way he had explained to the Society at the meeting in Hamburg, and was very well satisfied with it. It was not an anesthetic which could be applied and the excavation immediately proceeded with; it required to be sealed in the cavity for one or two hours; but if used in a proper way the anesthesia was really extraordinary and the vitality of the pulp in the cases in which he had employed it had not been impaired. Nervocidine was a very powerful anesthetic. It was employed for anesthetising the cornea in ophthalmology in a solution of 1 to 1,000. But even a solution of 1 to 5,000 would produce anesthesia in the cornea. He was very much afraid that such a paralysis of the pulp would probably interfere with the vitality, but much to his surprise, after two years of experience, the results were quite satisfactory. With regard to dryness and penetrability, his experience led him to believe that hydrocarbule such as was used for producing gas in automobile lamps was very efficacious in drying the cavity. It was put into the cavity in the form of a powder. He had had considerable experience in the injection of a combination of cocaine and adrenalin solution and his experience had been that of Doctor Miller. An injection of 2 or 3 per cent solution of cocaine in 50 cc. of solution combined with adrenalin gave very satisfactory local anesthesia for extraction.

DR. W. M. COOPER

Said that the use of adrenalin and cocaine in minor surgery had produced a number of cases of necrosis. He had no experience of it himself, but one of his patients, a practitioner in Frankfort, had told him that in hospital work they had repeated cases of necrosis where adrenalin had been used in combination with cocaine, and they knew nothing to which to attribute the fact except the presence of adrenalin.

Dr. G. O. Webster

Said that after Doctor Aguilar had mentioned the use of nervocidine he immediately took it up because it seemed a panacea for a good deal of trouble, but his experience had not been flattering as he had had severe cases of cementitis from its use and much to his regret had been compelled to give it up.

Dr. A. W. Harlan

Had been very much entertained by the exhibition given by Professor Miller and welcomed everything that contributed to eliminate pain in dental operations. In connection with the sensitive necks of teeth that did not require operations for filling or inlays, if they were carefully washed with distilled water and thoroughly dried, perfect anesthesia of the exposed cementum could be obtained by a paste of carbonate of potassium and glycerine. It should be applied so that it would not act upon the gum and the anesthesia would last for a considerable period. If the teeth were uniformly denuded of the gum and pericementum three, four or five treatments at intervals of a week or ten days would render them free from sensitiveness for several months.

Dr. Truman W. Brophy

Said the exhibition of Professor Miller had been of value and Doctor Miller's presentment of the case left nothing to the imagination. With regard to the use of adrenalin and cocaine, he desired to ask Doctor Cooper what was the strength of the adrenalin employed and the percentage of cocaine that produced necrosis. Personally he had had some experience with adrenalin chloride as a means of controlling hemorrhage and he was satisfied that a percentage very much weaker than that generally employed was all that was required. A preparation of about one part in a thousand, diluted to make one part in ten thousand, was the usually prescribed solution for controlling hemorrhage. If that was diluted again so as to make one part to twenty thousand and combined with a 2 per cent solution of cocaine it might be possible not only to control pain, but also to control the hemorrhage. The solution likely to produce necrosis would be a very much stronger solution than he had named. It was true adrenalin chloride would arrest circulation, and an arrest of circulation for any considerable time would be followed by death, but it would seem the solution must have been stronger than that actually required to accomplish the desired end.

Doctor Cooper

Said he did not know exactly the percentage used, but he believed it was 1 in 10,000. It was the solution commonly used in surgeries.

Doctor Bogue

Considered that Doctor Miller's very beautiful communication was along one particular line, namely: The penetration of the dentine by substances used in anesthesia, and that he carefully avoided saying anything as to the materials that should be used empirically—quite wisely. His own practice was a very limited one and he did not suppose he encountered a hundredth part of the difficulties encountered by his professional brethren engaged in a different field, but for eighteen or twenty years he had used a method which had never failed him. Chloride of zinc was advocated years ago and he tried it, but abandoned it on account of the pain it caused. Then it struck him that if he used carbolic acid as strong as it could be used, and by that means sufficiently solidified the albumenoids contained in the dental tubuli, he could use chloride of zinc in crystals and allow it to deliquesce. He did so, and he had been doing it for eighteen or twenty years, and notwithstanding the statement made by some of the learned professors he had not succeeded in killing one single pulp. One gentleman in Paris, Doctor Levett, said he did succeed in killing one pulp, but it took him so long and cost the patient and himself so much pains, that he would never do it again. He himself had succeeded in diminishing the pain so that there was very little complaint on the part of patients. It was hardly necessary to say that neither of the substances should be allowed to touch the gum. He had also used the same process in anesthetising, not for two, three or four weeks or months, but for a year, sensitive teeth caused by recession of the gum, and it answered in a great many instances.

Professor Miller,

In reply, said that the results obtained with nervocidine had been so conflicting and the disagreeable properties of the substance were so many that in Germany its use had been gradually dropped. Scarcely any one used it on account of the irritation of the pulp and sloughing of the gums, and it was rather a dangerous remedy to deal with. In the hands of Doctor Aguilar, who knew how to use it, it was all right, but in Germany it had not produced the desired results. As far as adrenalin was concerned, he thought those who had been tempted to use it would do well to take the preparation of Braun because then they knew exactly what they had, or better still, one of the novocaine solutions given in his paper. In extracting teeth, disagreeable results had been seldom observed. At the Dental Institute he found that although they had injected adrenalin and cocaine many hundreds of times for extractions, they had had no disagreeable results worth mentioning, but with anesthesia of the dentine a number of cases had been reported in which there was sloughing of the gums and hyperesthesia. It would seem that when the tooth was immediately extracted there was a vent and the excess of adrenalin escaped, but when no extraction was made there was no escape and the results were more disastrous. There was no knowledge of its action upon the pulp. Recently a case was reported where adrenalin was injected to anesthetise the pulp with the result that the pulps of the tooth and the two neighboring teeth died. Therefore it was necessary to be a little careful in the use of adrenalin. As Doctor Bogue had said, he avoided the question of what particular anesthetic should be used. He was only dealing with the question of penetration and pressure anesthesia, but he said in connection with superficial sensitiveness at the necks of teeth nitrate of silver and chloride of zinc would be the two substances he would use, adding that there would be a much deeper action if the application were followed by a coating of Fletcher's artificial dentine as already recommended. In conclusion he thanked the members for their courteous attention and apologized for having taken up so much of their time.

DISCUSSION OF THE PAPER "RENOFORM AS A LOCAL ANESTHETIC," READ BY CHARLES P. HASELDEN, D. D. S., HAMBURG.

Doctor Aguilar

Asked whether Doctor Haselden was sure of the efficacy of the prescription he recommended and asked what amount of solution was injected.

Doctor Haselden

Said that 1 ampule filled a hypodermic syringe.

Dortor Aguilar

Said the hundredth-thousandth of a gram of a drug was such a very small amount that it was surprising it could produce such an effect.

Doctor Haselden

Said that was the value of the whole thing; the amount of the drug and of cocaine was so small that there was absolutely no danger in using it. He had used 5 ampules and had never seen the slightest irritation of the gum or any bad effects whatever.

Dr. W. M. Cooper

Said that in his experience, with regard to the extraction of pulps after local anesthesia, he had sometimes found there would be perhaps ten, twelve or even twenty-four hours later a secondary hemorrhage, and even where a tooth was packed with cotton, secondary hemorrhage produced considerable pain and a great deal of annoyance.

Doctor Haselden

Said he had no experience of that kind.

Doctor Cooper

Observed that in cases where there was a large opening at the apex of the root there had been much trouble.

Doctor Haselden

Said he had simply treated the roots with iodine over night and the next day or the following day the cotton was dry, clean and sweet. It was possible hemorrhage might occur, but that would happen after any extirpation of the pulp. The anesthetic effects of renoform generally lasted two or three hours. Injected above the roots of the upper incisors the effect spread somewhat to the lips and nose, but the only bad effect he had was in the case of a patient who sneezed. There was absolutely no swelling, but there was the sensation that the lip was much larger than it ought to be. In a good many cases sensitive cavities along the neck of the tooth could be prepared for inlay in about an hour. Cavities in which the pulp had not been destroyed were as sensitive the second time he worked on them as they would be had no renoform been used at all. He did not think there was any harm done to the pulp and he should go on using the drug. If he found any bad effects he should be glad to let the members know at some future time.

Doctor Jessen

Said he had been using adrenalin tablets in a solution of about 50 per cent. The other day he had a case so sensitive that he could not penetrate the enamel, but he injected the adrenalin and cocaine solution and removed the pulp without the slightest pain. The question was whether the pulp returned to its normal activity or whether it was destroyed.

Doctor Haselden

Said that having prepared sensitive cavities by the method in removing temporary filling the entire sensitiveness he found had returned, which showed that the pulp was alive. No medicine touched the pulp directly; it was impossible to get a medicine through the bone. The drug inhibited the blood flowing around the pulp and as the pulp did not get enough nutrition for a time it lost its sensitiveness.

Doctor Jessen

Asked whether any one with experience of adrenalin and cocaine had found that it entered into the pulp so that the pulp could be removed without pain immediately following the injection.

Doctor Boutle

Had had two cases in which teeth had been filled for a long time with amalgam and had been very sensitive to heat and cold. He removed the amalgam filling and sent the patient away for a month or six weeks with a gutta percha filling, hoping that the non-conductng filling would help the pulp to recover its normal condition, and that he could put a porcelain filling in and save the pulp, but the patient came back at the end of the tme complaining that all the time she had had continual recurrence of sensitiveness and he decided that the best thing to do would be to remove the pulp. It was necessary to have a thorough exposure of the pulp to the anesthetic action, but the cavity was so sensitive that he desisted from drilling and applied adrenalin and cocaine with pressure for about two minutes, and when he started drilling the tooth he had absolute anesthesia and took out the pulp without any pain. He filled the root at once as the patient was returning home and would not be able to see him again for six months. He had had the pleasure of seeing her recently and she told him that from the day he removed the pulp she had absolutely no sensation. It proved that adrenalin and cocaine could be forced through so that the pulp could be removed painlessly. He avoided the sensitiveness that sometimes occurred at the apex of the tooth probably through carrying the pressure too far, causing some of the adrenalin to be forced into the pericementum.

DR. H. J. MOORE

Asked the difference between adrenalin and renoform, if there was any difference except the trade name. They both seemed to be made from the same substance.

DOCTOR HASELDEN

Said he could not give the chemical formula. The difference seemed to be that those who used renoform reported they had never had a case of sloughing of the gums or necrosis, whereas those who used suprarenalin products reported to the contrary effect. Suprarenalin was said to be extracted of the suprarenal gland and was an organic substance.

DISCUSSION OF THE PAPER "A YEAR'S PROGRESS IN PORCELAIN PROSTHESIS," READ BY DR. N. S. JENKINS.

DR. W. M. COOPER

Asked in what manner the fuse was applied and the cost of renewal.

DOCTOR JENKINS

Said the cost was extremely trivial. The wire was very small and was in the secondary current where the effect was very slight. Even if its cost were considerable it would be a matter of no consequence, as the metal was not lost.

DOCTOR COOPER

Asked whether it would be readily applied and whether the furnace was on the market.

DOCTOR JENKINS

Replied that it could be applied in the snap of a finger. The furnace was not on the market; the experiments were practically concluded, but in the higher fused porcelains there were still a few experiments to be made and until they were accomplished it could not be pronounced perfect.

THE SOUTHERN WISCONSIN DENTAL SOCIETY, TWELFTH ANNUAL MEETING, MILWAUKEE, MAY 30, 1906.

DISCUSSION OF PAPER BY DR. TALBOT, "INTERSTITIAL GINGIVITIS DUE TO AUTOINTOXICATION."

Dr. C. L. Babcock:

Mr. President and Members: Nothing would give me greater pleasure than to feel that I was competent to open the discussion on a paper like the one just read to us by Dr. Talbot. The most that I can do is to heartily express my gratitude and admiration on this occasion. We all of us at some time, I think, have listened to papers or addresses, or read books which we instinctively feel are informing, and that after having listened to or read we have a wider and better conception of the subject than we had before. It is with that feeling that I listened to Dr. Talbot's paper. While there are many things that he has stated that are new to me, and only partially understood, yet it is presented in such a way that I can only feel that they are true. I can only close by thanking Dr. Talbot for coming up here and reading the paper to us.

Dr. G. V. I. Brown:

I would like to thank Dr. Talbot for that paper. First, I am glad my friend Talbot has learned how to write a paper. He has been trying to take us in through the top story of this subject for a number of years, and it has been very hard to understand the pathological illustrations he has given us. Now he has given today the best explanation, the most scientifically simple discussion of this question of auto-intoxication that he has been talking about for so many years that I have ever heard. I am pleased also to note that it fits in so nicely with progress along other lines in medical science, and notably, as an illustration, the newer idea that is gaining ground with regard to the administration of anesthetics. We are learning that anesthesia is merely a form of poisoning. We used to congratulate ourselves when the patient left the table, and feel that the trouble was over. Now we know better. We know that there are likely to be in that individual certain changes, notably the liver, in the way of fatty degeneration, which will give, perhaps two or three days or a week later a much more serious condition than we had at any time while the patient was upon the table. That was very beautifully demonstrated last year in experiments by Dr. Bevan and others of the Portland Medical Association, in the course of which they were able to actually produce fatty degeneration of the liver in rabbits by the use of chloroform. As I understand this and apply it, that is simply a modern example of what Dr. Talbot has been trying to make us understand for a good many years. He has been trying to make clear to us the relation between the liver, the kidneys and those other organs concerned in metabolism and in elimination; and this question of auto-poisoning, through the failure, or whatever the reason may be, of any one or more of these organs to accomplish that which it is their physiologic office to perform. The dark brown taste that some of you may have heard of is perhaps another illustration pure and simple of disarrangement of these organs, and I want to say that Dr. Talbot learned that matter about being able to eat eight times a day and have good digestion from me, but he did not learn that he could drink a great deal of liquor and still be all right. I want to try to bring, if possible, these facts of Dr. Talbot's down to that which we all recognize as the essentially practical portion of the subject. It is difficult for a man to sit and listen to a paper which deals with those facts which appear to be rather abstract, so far as his own daily experience of treating interstitial gingivitis or pyorrhea alveolaris is concerned. He knows that most of the time he does not have a great deal to do with those conditions that this paper has related at such length. He knows that by purely local treatment he has accomplished a great deal. My understanding of this paper, if I do understand it correctly, is this: Dr. Talbot has made it clear that almost from the time of birth the individual is exposed to many germs, in great variety. That when each part is performing its office correctly and properly no practical harm results from those germs, because the individual is immune. If in a general way there is failure the result is some one or more of the general diseases from which people suffer. If there is a local irritation or disturbance which reduces the resistance of that particular part, then these germs, which have otherwise not affected it, become effective, and these poisons which would otherwise pass unnoticed, become effective. So we find the teeth in the mouth. Those that are exposed to unusual irritation, to irregular biting, to uncleanly conditions, to all of those other conditions which we recognize generally and commonly as being associated with pyorrhea alveolaris or interstitial gingivitis, then there is at that point made manifest this condition of auto-intoxication. To get the best result one must recognize both the local condition and the general, and in that way perhaps do his best work. I believe with this paper as a beginning, that we will all understand the rest of Dr. Talbot's work that he has given so much of his life to demonstrating, much better than we ever did before.

Dr. L. A. Meyer:

Dr. Talbot's paper is certainly very interesting to me, because when I think back to the time that I attended a meeting of the Wisconsin Dental Association at Madison, and was an eye witness to Dr. Good working on a case of what he termed pyorrhea alveolaris or interstitial gingivitis, I, being rather a young practitioner, took the matter up and went on what he told me. He said: "Never mind, doctor, what the cause of this is, and the outcome; I know that I am doing this man some good." He was applying the surgical treatment for the case; that is cleansing the teeth of this calcic deposit, and otherwise giving the patient directions as to care of the mouth, and correcting in fact all the local conditions he could see. In listening to Dr. Talbot's paper, I never knew I had a stomach until this afternoon. I wish to speak on this subject because I have brought two cases with me that are in line with this thought. One is a patient where I think the cause was due wholly to a local condition. As Dr. Brown says, 90 per cent of pyorrhea is caused by mal-occlusion. I have got one case that I think was due to mal-occlusion, and I corrected the irregularity, fixed the necessary retaining appliances, etc. I have dismissed the case as cured, and it will be here on exhibition tomorrow, and you may judge for yourselves the results. The other case is one that I have been working on since February, and is partially completed. This case, I think, is a combination of troubles, a local and a general systemic disturbance, and I am gaining slowly very gratifying results. That case will also be here tomorrow, and I think will speak for itself rather more than I can explain it for you. I wish to follow this up after the report of the clinic and after you have viewed the case. I fully agree with Dr. Talbot and think the interstitial gingivitis is an expression of systemic disturbance which you read in the mouth. One thing that has led me to believe that is cases occurring in my own practice. I have in mind now a lady patient whom I have treated for ten or twelve years, possibly longer, who summered at Oconomowoc and spent her winters elsewhere. I have been treating loose teeth for her for a number of years. Finally her health began to break down, so that she made a visit to my office just before going abroad, and the mouth was in a terrible state. The teeth were in such condition that I said: "I really am not competent to advise or do anything for you." "Well," she said, "Doctor, just clean it up for me anyway, and let them last as long as they will." She went abroad, came back in the spring. I made another examination and congratulated her upon the condition of the mouth and the firmness of her teeth. I said: "You must have met with an unusually skillful dentist abroad." She said: "I am surprised to hear you speak that way, because I have not been in a dentist's office since I left here." Now there was a case of elimination of the excretory organs, and the tonicity of the nervous system had been brought about by the proper performance of the functions. The trip abroad performed the cure.

Dr. Talbot:

After a person has become 30 to 35 years of age there is hardly a case that comes to us but what has some condition of the eliminating organs that must be adjusted. Now, no surgeon undertakes a surgical operation without first putting his patient into a proper condition so that the wound will heal rapidly. If he does not do that he is liable to have more or less trouble. The principle, therefore, is precisely the same, whether a surgical operation is to be performed, or whether this disease is to be cured. It is a fact that every case can be benefited by local treatment. Perhaps the gums may be healed by local treatment, but if the eliminating organs are not in their proper condition it will come back again. Now only about three or four months ago I had quite a conversation with a man who has a national reputation and who makes a specialty of this disease, and while he does not treat it locally, as he used to, he has learned a good deal about it. I questioned him quite a good deal in regard to the habits of his patients after he had cured the gums, as he claimed to do. I found that every patient had to come back as often sometimes as every two weeks, sometimes once a month, sometimes four times a year, and sometimes twice a year, to have the gums treated again. Now this is a very important point, and those of you who have given it any thought must have noticed that this does occur: That when we get these gums tightened, healed up so to speak, they don't stay tightened and healed, but the disease comes on again; and it is due to a great extent to the fact that the eliminating organs are not doing their work properly. I would suggest, as Dr. Meyer has suggested here, that when we get a bad case, change the environment; have them go to Hot Springs or Waukesha or some other place and get boiled out; cleaned out. It is wonderful what such treatment as that will do for these cases. They will come back apparently healed up as the doctor has said, and they will stay that way as long as the eliminating organs are doing their work properly. But if they are not, if they go back to their old environment, take the same kind of food, and intestinal fermentation comes on—and most of us have it after we are 30 or 40 years old—then we must expect that the blood will become charged with effete matter, and that disease will get its work in and continue until the teeth drop out.

DISCUSSION OF A PAPER BY DR. G. C. MARLOW, OF LANCASTER, WIS., ON "A FEW REASONS WHY INLAYS SHOULD BE USED IN THE POSTERIOR TEETH."

[Dr. Marlow's paper was a duplicate of a paper read by him before the Wisconsin State Dental Society and published in the February, 1906, number of THE DENTAL REVIEW.]

DR. E. J. HART:

I am convinced that porcelain inlays, where the conditions are just right are the best fillings we can put in, and probably the most durable; but there are limitations that we become acquainted with as we proceed with the work. Some of these we do not find out the first year, but we become acquainted with them later on. In very many cases it is not strong enough; the edge strength is not sufficient. Then it is necessary, where the inlay approaches the occlusion, to have a sufficient bulk of porcelain, and that often necessitates cutting the teeth more than is proper. I should say that inlays are our best means of supplying the loss of teeth through caries, but I should want to include other forms of inlays. When any one wants to use inlays entirely the gold inlays should be used in very many cases of the posterior teeth. It is not necessary to cut away the teeth nearly so much, and there is no danger of fracture of the margins, and the color often is not much of an object. It does not need to be considered in very many of the cavities in the posterior teeth. I fully agree with Dr. Marlow that there is nothing like porcelain, where porcelain should be used, therefore I wish to say again, the great thing is to find out just where it is indicated.

Dr. C. F. Rodolph:

I believe porcelain, if properly inserted, has got a greater edge strength than any other material. It is almost impossible to take even a disk cavity, if it is properly inserted, and fracture the edge of it even with an instrument. There may be places where the continual biting may possibly wear down the edge and cause a fracture. But even then I believe it will stand better than a gold filling. I do not believe there is a cavity in the mouth that can not be filled with porcelain that can be filled with any other material. In general practice I use more porcelain every day. It has been my experience that wherever I can put in a cement filling and make it stay, I can put in a porcelain filling.

Dr. W. H. Cudworth:

I am sorry that Dr. Marlow has after two years' experience come before this meeting and is willing to put himself on record as believing that porcelain inlays are the proper thing in all cavities. I think in six or seven years from now he will be very sorry that he did it. That has been my experience. I agree with him in the saving qualities of an inlay, but there are cavities in the teeth where we should put in some material that would give us the greatest strength possible. The stress of mastication is something that would in certain localities absolutely crush the edges or margins of a porcelain filling. If it does not it will crush the frail margin of tooth enamel that has been trimmed to that extent to allow the large bulk of porcelain. Now inlays are a good thing, but I believe that one of the best things about them is the fact that the longer a man uses them the greater judgment he is prone to display in the places he puts them. Dr. Marlow spoke of putting in inlays in the buccal surfaces of teeth. It may not seem probable, but it is a fact that with the best cavity preparation that we can obtain, those localities are the places from which inlays are the most easily dislodged, and as to putting them in the posterior parts of the mouth, I can see no good reason why you should. As Dr. Hart has said, inlays made of gold afford a greater protection to the margins of your cavities, they afford a greater protection to your tooth, you can strengthen the tooth better with it by carrying it over the margins of the cavity, you can make a better surface for mastication and proximal contact than you can with porcelain, and you obtain the same results, almost, as far as thermal changes are concerned. So I can see no necessity for a man going to the labor and the greater skill that he would have to use in making porcelain inlays for teeth posterior to the first bicuspid. We have here with us some gentlemen from outside the state. I move you that the courtesy of the floor be extended to them. I would like to hear Dr. Perry, Dr. Clack and Dr. Booth. (Motion carried.)

DR. E. J. PERRY:

It would be a strange thing if a man should rise and say that he has nothing to offer upon the subject of filling teeth with inlays. The inlay principle, as Dr. Cudworth has said, is absolutely without an objection. I believe that as the years go by we will use the inlay principle more and more. I think the paper perhaps was a little bit sweeping in the statement that all cavities in the bicuspids and molars should be filled with porcelain. If you younger men will start at inlay work you will find that the field will widen and that you will learn more about cavity preparation, which is the basis of the whole thing. Now Dr. Hart is a timid man. He is too timid. I say to you that this prejudice against the sacrifice of tooth structure is responsible for the loss of more teeth than any other one thing. Don't be afraid to cut. Cut down until you have a bulk of porcelain. The more I prepare cavities for inlays the less fear I have of cutting, and I believe that that is the key-note of the situation, the proper preparation of the seat of that inlay. I agree with the gentleman with the Bryan face, that if the cavity is properly prepared, and no thin edges drawn out, generally speaking, that the edge strength of porcelain is sufficient. I believe that the gold inlay is an important factor in molar and bicuspid restorations as well. I do not think that it depends as much upon the material as Dr. Cudworth does, but upon the preparation of the cavity, and having a sufficient bulk of material. There are places where you may place inlays where the edge strength is indispensable to success; where it must be drawn out into a thin layer. In those cases the gold will batter down and the joint or line of union between the filling and tooth will be made better even by use.

I do not advise any man to throw his gold pluggers or amalgam pluggers away, nor any of his instruments, but I say to you broadly that the best filling to put into a tooth is the filling that fills the most requirements in the individual case. I can not get along without gold fillings, amalgam fillings and I am sure I could not get along without porcelain or gold inlays. I would like to draw your attention, however, to one kind of an inlay which is perhaps new to most of you—moldable porcelain. I am going to give a clinic tomorrow morning and tell you how to prepare the cavity and take the impression and make the inlay. It fills a peculiar place of its own in the very large restorations. I make probably 60 or 70 per cent less gold crowns than I used to make. I don't think a band around the root of a tooth is a good thing anyway. I want to call your attention to a comparatively painless way of of cutting away a large body of sensitive dentine, and that is having the stones run in water. I think about the most painful thing which you can do to a patient is to run a bur at a high speed in a dry cavity. I am able to do this so-called heroic cutting with the stones run in water, so that the water is almost a running stream upon the bur or stone, and it can be run at a high rate of speed. I don't do painless dentistry, but I think I could fill a tooth for Dr. Hart so that he could stand it, and do it in that way. You have got to cut. Decay itself won't be accommodating to you in producing the right shaped cavities. That is the basis of the whole thing, the cavity preparation.

DR. WILLIAM CLACK, Clear Lake, Iowa:

Quite a number of the members of our clubs use porcelain, and I will say frankly that if I thought I could make a porcelain inlay that was as good as a metal filling, I would make porcelain inlays even at my age. I would work as hard as I have worked in the past decade along gold lines, as the sight of a large amount of gold in the anterior teeth is no more unpleasant to any one than it is to myself. But I have seen so many failures with porcelain inlays that I am afraid of them. Don't understand me as saying that I have never seen failures of metal fillings. I believe that the failure of metal fillings and the inability of a great many men to make good cavity preparations and good metal fillings has led them into making porcelain inlays that can be cemented into almost any shaped cavity. That is a practice in porcelain inlays that is going to do a great deal of injury. I would be very glad indeed if the time was now when porcelain inlays, or inlays of any material, could be made to last as many years as the gold operations made by some men of my acquaintaince, because there is hard work in making a gold filling of four, six, ten or twenty sheets of gold. There is considerable backache and eye strain about it, and I have understood from the patients that it is not entirely a holiday with them. Speaking of the cutting of the cavity and the giving of pain, I have been taught, and experience has borne me out, in a great many cases that sensitive dentine can be more painlessly excavated with the cavity entirely dry than it can with the wet cavity, with the instruments that I have been accustomed to use. I believe the man who plunges a large bur, or any bur for that matter, into a cavity, and as fast as he can run the engine by hand or driven by electricity, bores into that tooth, is a brute. There is no necessity for that kind of work. We have found that very sharp, well-tempered instruments in the shape of chisels produce less pain. I know that to be a fact myself, but I don't know sufficient about this matter to know whether preparations may be made for porcelain with those hand instruments. I have very little trouble with my patients in the adjustment of the rubber dam. If I were the patient I would kick with both feet if a dentist adjusted a rubber dam as I have seen it adjusted at many a meeting. Only a year or two ago I saw a patient in a chair at a clinic, with a rubber dam adjusted and the ten anterior teeth ligated to make an operation in a central incisor. Now we believe in placing the dam over a sufficient number of teeth to gain access readily, but it is seldom necessary to ligate more than the tooth you operate on, unless it may be cavities in the proximal surfaces where you have to step over to the other tooth. The porcelain inlays that have come under my observation have failed from stress, and I think few men realize the amount of stress exerted by the average person. I am not a young man any longer, but I can bite 240 pounds on my first molars, and I tell you that it will take a better piece of porcelain with thin edges to withstand that stress than any that has ever been the pleasure of the Black club to test at our meeting. We have gone into this thing considerably. We want the porcelain inlay if we can have it, as Dr. Cudworth suggests, but the experiences we have had in testing those things have made a good many of us skeptical. It does not seem to me either from reasoning or from experience that I have had, that it is possible to make that bevel of the margins for a porcelain inlay that we can make with gold, and I think Dr. Perry has stated it very correctly when he says that the gold filling that batters down under stress will withstand more stress and will leave the tooth in better condition to resist that stress than the porcelain inlay. Dr. Marlow spoke about the lodgment of food on the gold fillings. I have seen the lodgment of food take place with thousands of gold and amalgam fillings, and if you would look at those fillings you would wonder that more did not lodge there—fillings made without the slightest attempt to restore interproximal space, or embrasure. I believe fillings may be made in the proximal surfaces of teeth so that the use of the toothpick is almost unnecessary. I believe if those fillings are properly shaped and those embrasures properly made, that that objection against metal filling will not properly hold.

DR. CUDWORTH:

I did not arise to take back anything that I have said. I merely wish to say that this question of inlay work, whether porcelain or gold, is so broad, there are so many details in the making of an inlay, that I claim no man has the right to make as sweeping a statement as Dr. Marlow has made before a body of men of this kind. A great many of the failures in porcelain work in the first few years of its use were attributable to the making of cavities or the demonstrating of the use of porcelain in cavities made by commercial demonstrators, their principle of cavity preparation being far from the right principle or the right lines upon which to work. Consequently many failures. Each man had to work out for himself his success or his failure when he took up that line of work. For that reason I believe that broad statements of this kind, made by reputable practitioners, have a bad effect upon the young man who is just starting out or thinking of starting out in porcelain work. Dr. Clack made a remark in regard to the attachment of food or mucus to the metal filling and the porcelain filling. There can be no comparison. There is no man living who can so polish a metal filling of any kind that it will not hold more of the secretions or sediment of the mouth than the porcelain. I believe that there is no material that we use, also, of which the gum tissue is so tolerant as porcelain, where fillings extend under the margin of the gum. That is one of the reasons why I believe that the recurrence of decay around a porcelain inlay is of so rare an occurrence.

In regard to the cutting of a cavity as painlessly as possible, I thoroughly agree with Dr. Perry that a great deal of that pain can be eliminated by the use of water upon the stones or burs. I have demonstrated that more than once, keeping the water running from the syringe upon the stone and bur also, and especially a fine, sharp bur. It would clean the bur, it will cut faster and cut with less pain. There is nothing that has given me more pleasure at any dental meeting that I have attended than to hear a member of the Black and Wedelstaedt clubs acknowledge that there might be some good in inlays. Six or seven years ago when I went over to Clear Lake Dr. Wedelstaedt would hardly speak to me because I was making inlays, but I really believe that he himself might acknowledge today there was some good in inlays. Over at Decorah last fall Dr. Black was called upon to tell what he thought about inlays, and he thought that perhaps there might some good come out of them, but he didn't think they were perfected at present. I don't think any of us do. And I think that after careful discrimination as to where gold inlays or porcelain inlays are bad, we shall finally come to the belief that inlays are the tooth savers, whether it is the result from the extensive cutting away of the cavity and the preparation of the cavity, or whether it is because the inlay is rooted into the cavity with a substance that practically seals the tubuli, or whatever it may be, I believe that good is coming out of inlays, and more good is to come, but I don't like to hear such sweeping statements made, because I have had more troubles with inlays and I have made more than any of you.

Dr. C. N. Booth, Cedar Rapids:

I believe in inlays in their place. I believe in gold fillings in their place. I make gold fillings, gold inlays, and porcelain inlays. I am a member of the Wedelstaedt club of Iowa, too. But I will say this: I don't make porcelain inlays in the molars and bicuspids. I am just a little afraid of porcelain in molars and bicuspids, and where I am permitted to do it, the patient being willing, I have made those restorations principally with gold fillings, excepting in cases where the tooth will not permit it. I believe in the statement of Dr. Perry, that more teeth are lost from being afraid of cutting tooth structure than for most any other reason that we have. I believe that tooth structure should be cut so that we get rich, clean areas with our cavtiy margins, and it also helps us in getting a body of porcelain in porcelain inlays. I do not believe that porcelain has the edge strength that a metal filling has and gold inlays, nothwithstanding the gentleman with the Bryan face thinks that.

Dr. J. S. Danforth:

I find the adhesion of the cement to porcelain much better than it is to the gold inlays. We want to be a little careful in using gold in that respect.

Dr. Rodolph:

When the porcelain is closely imbedded in the cement it is almost impossible to break the edge without first wearing away the cement. My friend Dr. Clack has made a remark about the stress in the mouth, of a molar tooth, with a porcelain inlay. It is a fact, but when once properly set with cement I very much doubt whether he could break a porcelain inlay any more readily than he could an amalgam, or any other kind. I believe it has more strength in that way than any other substance. You can take a crystal from your watch and break it in your fingers, but the minute you imbed that in cement as you would an inlay, you can stand on it with your full weight, and not break it. It is the same with an inlay.

Dr. Cudworth:

There is one other little point that Dr. Perry has called my attention to in Dr. Marlow's paper, that the varnishing of an inlay after setting, for the purpose of keeping the moisture from the cement, by almost all inlay workers has proved incorrect. The cements that are used today in setting inlays are what are called hydraulic cements. We have better success with those cements, for after a proper crystallization has taken place the moisture is immediately allowed to flow over.

Dr. Marlow:

As a member of the profession I want to thank the gentlemen for the hearty discussion they have entered into in regard to my paper. When I wrote this paper it was not with the thought of enlightening my fellow practitioners entirely, but I was a little selfish. It was to gain something out of the discussion that might follow, and that is the reason that I place before you today a paper that was written a year ago, relating my experience practically two years ago. Now I made rather broad statements there, and I am going to forgive my friend Dr. Cudworth for being sorry for me for going on record as making these statements, for I believe that these broad statements that I made were the means of the doctor making equally broad statements in regard to this. I think that if you let a paper go over with things that seem objectionable, without criticising them severely, they are too liable to be lost, and as the doctor says new beginners will bank too much on what the essayist has to say. In the first place, by relating my experience of two years ago at this time in this paper, the statement seemed to the doctor that we were perhaps putting porcelain inlays in all cavities we filled, which is not true. We are using all classes of filling material today, and were at that time. I was simply relating my experience with porcelain inlays. We have since taken up gold inlays, and find them very good, very durable and places for them. In getting to the point of filling posterior teeth with inlays of course we come on gradually. I started, I presume, as all others, in anterior teeth. Cavities that we could get to very easily, and as the practice and experience went on, gradually working back and working up to that point, I find that it can be quite easily accomplished, to insert the inlays in the posterior teeth. That is the part that seems to be the sticking point with a great many, they have not tried it.

DISCUSSION OF THE PAPER BY DR. E. A. GEILFUSS ON "PATHOLOGIC INFANT DENTITION."

Dr. Louis Stephan:

My experience in the care of infant children has been rather limited. Before I studied dentistry my brother, who was an infant at the time, during the period of teething showed decided nervousness, which finally resulted in convulsions. The child was under convulsions from 1 o'clock in the afternoon until nearly 1 the same night. We frequently called our family physician, who ordered the child to have hot baths and other treatment internal. However, it did not seem to reduce the nervous condition, until the final lancing of the gums, and it was but a half hour after the gums had been lanced that the convulsions ceased and the child seemed to have returned to a normal condition. However, this seemed to have affected his nervous condition to such an extent that he had for ten years afterward suffered with convulsions now and then. I have often thought of that case since, and I have practiced the same method that Dr. Geilfuss suggested in a number of cases, and have never failed to get instant relief. I believe that we all ought to give this matter more thought. The physician generally seems to pay very little attention to the dentition of the child, with the exception of the general nervous disturbance by internal medication, etc. I am satisfied, as Dr. Geilfuss has stated, that these conditions may be alleviated and prevented by lancing at the proper time. It seems natural that the undeveloped root of the tooth erupting, making an effort to crowd through the overlying gum tissue, which may not sufficiently absorb, should cause a pressure downward upon the pulp tissue, the root being undeveloped, with sharp pin points, naturally would cause considerable irritation of that nerve tissue, and eventually cause reflex action of the entire nervous system, thereby resulting in convulsions; twitching of the muscles.

Dr. E. J. Perry:

I was thinking how different one man's practice may be from another's. The doctor says he has lanced the gums of at least a hundred children.

Dr. Geilfuss:

No, I said I had lanced the gums, in the last three years, of over probably a hundred erupting teeth.

Dr. Perry:

I don't think I have lanced that many in thirty-five years' practice. They don't seem to come to me. I think the theory likely is correct, that the pressure of the overlying tissues, the fibrous tissues, being so dense, causing this pressure of the partially developed root on the tender pulp tissue, may cause these convulsions. The case related by the doctor who has just spoken was vitally interesting and to the point. I am glad he told that. I may be called in to such a case tomorrow. I have a doubt in my mind and have had for years of the correctness of the old theory about the difficulty of absorbing cicatricial tissue. I had created in my mind a prejudice against lancing the teeth of children because of the danger of producing this cicatricial tissue which would be absorbed. I think that is a most excellent paper. I have no fault to find with it. I wish I had. I like to hear papers criticised.

Dr. Clack:

It has not been my fortune to meet with many of these cases. As Dr. Perry says, they don't come to me. The few that I have been consulted in relation to I have succeeded in giving relief by prescribing little chunks of ice held in the mouth for a few moments, frequently quieting the child so that it would be asleep within ten minutes; relieving the blood pressure for the time, allowing the hyperemia to subside. I am not of the opinion that the lancing of the gum would be detrimental, if I thought that there was a formation of pus, or even of a fluid that we find there sometimes, that you can hardly call pus; a kind of a serum. If I thought there was sufficient pressure from that to produce pain I should lance it.

Dr. Maercklein:

I feel like thanking Dr. Geilfuss for bringing this subject before the association, and complimenting him upon the manner in which he has presented the subject. In the general arrangement of the subject it has been most admirably followed. I can perhaps substantiate some of the points taken in the paper from a practical standpoint, having had considerable experience in that line, and I perhaps agree with the gentleman that a very large number of practitioners never see any of those cases. But if you once get started in that line you will be surprised how many calls you may have to attend that class of cases; and I suppose it has been one of the fortunate coincidences perhaps in the life of Dr. Geilfuss to have gotten started correctly, and when you once get started you will be called a great many times. I have had dozens and dozens of calls of that kind, and I desire to emphasize the position that he has taken, that whenever there are pathological conditions arising in connection with erupting teeth, that you can not possibly make a mistake by lancing them down till the point of the lancet strikes the erupting tooth. Of all the single rooted teeth one incision on the line of the alveolar proper is sufficient. However, on the molars a cross incision should be made in each instance, like an X, so as to free the four cusps of those teeth. I remember one instance where one of our learned physicians in this city spent an entire half day in getting the family history of the parents of a little twin girl who was subject to epileptic fits, as he called them. She would be perfectly well, and be seized with a pain, give a yell and fall over unconscious in the midst of her play. A child nearly two years old. The physician could not find anything the matter with her, and he thought there must be some hereditary tendency in the family. I was called in consultation in the case. The doctor rather smiled at that idea. On examining the mouth I found that all of the teeth has been erupted excepting the second temporary molars. There was very slight tumefaction only over those, but the gum tissue was very dense. I made the cross-section incisions over all of the four molars, and from that day to the present time the child has never had another repetition, and we have not had to go into the great grandparents' history. I could recite dozens of that class of cases, perhaps not going into it so much in detail, but with exactly the same results. Several of my own nephews and nieces were troubled in the same way. A little niece of mine had convulsions half a dozen different times in half a dozen different days, and apparently perfectly well. Again the lancing relieved it and she has had no more since that time. So far as the lancing is concerned, the doctor has covered the position. As regards the one point of cicatricial tissue forming over those lanced teeth it is rarely the case that you ever get a perfectly formed cicatrix. The pressure underlying those teeth usually pushes them into such a position that the gums separate and bulge far apart, immediately after lancing. But should this not be the case, there is absolutely nothing in the statement that the cicatricial tissue is derogatory to the easy erupting tooth. On the contrary it absorbs more readily than in normal tissue. All secondary formed or cicatricial tissue is the first to break down when there is a pressure brought to bear upon it.

Dr. Geilfuss:

I wish to thank the gentlemen who have discussed this paper, and particularly Dr. Maercklein, for the points that he has brought out, and which have substantiated my own experiences. I will say, gentlemen, that this is not a subject for which I claim any credit myself. The ideas I have advanced on it I imbibed from the teachings of Professor Truman, my teacher in dental pathology and therapeutics. I will say that in the years that have recently gone by I have had occasion to thank him many times for that. Up to three years ago, in my practice of more than ten years at that time, I don't believe that I had been called in in over five cases, and I naturally ascribed that to the fact that I had not been able to impress the necessity of that operation being performed upon people with whom I came in contact, they not having young children or infants. I will say, though, that wherever I knew there was a possibility of patients of mine having children I endeavored to educate them on this subject. I believe in preaching to my patients and making them more intelligent if possible. About three years ago a patient of mine to whom I had preached on this subject called me in, and I had occasion to lance for a number of developing teeth on a little fellow five months old with marked relief. In fact that child erupted five teeth before it was six months old. I went south and during my absence the child was troubled with other teeth. Another practitioner was called in, a man who was a close friend of mine, a man for whose opinion I have the highest respect, that is, as a dental practitioner, and he refused to lance, claiming that he did not believe in it. Matters were left in that condition. I returned three days afterward and the first thing that I heard was that I was to immediately go down and call at this house; that they left word they wanted me to come right down, and I did. I have never seen a child in convulsions myself, but I have seen them have considerable trouble, seen their bowels in disgraceful shape, and in this particular case I lanced, and within half an hour that child was asleep and apparently free from all pain and from the report the next morning the bowels had straightened out, although they had been out of condition for ten days. That case set me to thinking. I didn't know whether my ideas on the subject were correct or not. I had been preaching them for a good many years, and if they were not correct I wished to be corrected. I reported this case at our local society, the Milwaukee Odontological Society, and I was very much surprised to find that out of fourteen or fifteen members present that night, not more than one or two had ever in the course of their practice, and some the members were men who had been in practice longer than Dr. Perry—Dr. Holbrook and Dr. Richter—neither one of whom had ever been called to operate in a case of that kind. I think that was due, as I stated in my paper, to the fact that the care of the infant is usually in charge of the family physician, and since this matter has been impressed upon me and since I have endeavored to gain the opinion of more, particularly the medical profession in the matter, I have been surprised to learn that they did not believe in it; and as I have quoted from these two authorities, Hale and Griffin, they both decry the lancing of the gums except in rare and exceptional cases. I can see no reason why the gums should not be lanced in all and every case where there is the least indication of a possibility of trouble coming from those teeth, and as I say in all the cases in which I have ever operated I have never had any reason to regret it. I have never had any complications ensue. Two or three weeks ago I was called in to operate on a little fellow, the son of a physician in this city. I had lanced for some of his teeth before that time, and I lanced for the first molars. One of them was partially erupted, the other three were not. I lanced the three molars, and the next morning two of them were through. The next morning after that the mother telephoned to me that the child that had been relieved seemed to be getting back to its old trouble, and that possibly the same teeth were bothering it. I went up there and found that the gums were apparently normal, and I lanced very deeply; lanced every one of the cuspids, and realizing that the mother probably would feel that the success or non-success of the operation depended upon the eruption of those teeth, I told her that I did not expect they would erupt in three or four weeks. That I had an idea that probably those gums, while the child might and probably would get relief from the operation, still those gums would probably heal over. It might be necessary to lance again at some future time. At any rate I did not expect to see its teeth erupt within three or four weeks, but within twenty-four hours the points of two of them were out. I feel that it is a simple procedure, and it is a matter that has given a great deal of relief.

THE MINNESOTA STATE DENTAL ASSOCIATION, JUNE, 1906.

DISCUSSION OF THE PRESIDENT'S ADDRESS, ENTITLED, "SOME NEEDS OF DENTAL SOCIETIES AND THEIR MEMBERS."

DR. S. R. HOLDEN:

There is just one point the president brought out about which I wish to say a word, and that is in reference to the kind of practice we are doing, and which we are to have in the future. I think he is right. The man of the future if he wishes to do anything along a specific line, must first have a general knowledge. If a point of superiority is reached it is always the result of general knowledge, and it is with that kind of men that we expect to fill the profession in time to come.

Another important point he mentioned was the matter of safeguarding our interests in the way of laws. It was a good suggestion, and I am sure we can profit by everything he has said.

DR. ALFRED OWRE:

I think the president's address is one which fully demonstrates the opportunities of this association. We have been told what we must do to advance the cause of dentistry. We have to depend, primarily, upon the education of our members, and this paper has dwelt on that fully, bringing out some very high ideals. Some of these ideals are too high, and perhaps the general inactivity is due to the fact that we are not all up to this high level. But we hope for better things. The fact is, we have been growing from the simple to the complex, from the concrete to the abstract. In his paper the president speaks several times of education, and the meaning is that we must depend upon science to educate the profession. The reference to oral prophylaxis is well worth noting; improvements must come from this direction, and I was very glad to hear that matter emphasized. I shall take great pleasure in reading the paper when it is published. Its suggestions ought to be valuable in our daily work.

DR. F. B. KREMER:

I hardly know how to discuss Dr. McCrea's paper, because there is nothing in it but what I approve of. I am sorry that, while he was at it, he did not elaborate more fully a scheme for the accomplishment of some of the good things he recommended. The paper, as Dr. Owre expressed it, is a plea for higher education. We have views as to what constitutes higher education, and apparently we have regarded it, thus far, mostly as an effort along the line of mechanical perfection. I do not know whether you agree with me, but I think we have reached a point where we can take up something a little different than that, but how to do it is the next question. We have to depend upon our colleges and our colleges have to depend upon the public. I think Dr. Owre will agree with my position when I say that the first essential requirement to the accomplishment of the ideas set forth by the president is an endowed dental college. Dental education, it seems to me, should be handled along different lines. I would like to see an endowed college so we might be able to say when a man was ready to graduate. At the present time I think we are doing exceedingly well considering the difficulties under which we labor. When the time comes that a college will be in a position to say what shall constitute a dental curriculum, I hope to see the M. D. made obligatory before the D. D. S. is to be considered. I do not believe the present dental curriculum is broad enough to make a dentist as strong a professional man as he ought to be, and I believe the foundation upon which to build the requirements the president speaks of must be laid upon a knowledge of general medicine. Not that medical practitioners know more about dentistry than we do, but we would know more about dentistry than we do if we were to graduate from a medical college or a dental college teaching the broad principles of medical science.

Dr. C. M. Work (president Iowa Dental Association):

Mr. President and brethren: It gives me a great deal of pleasure to be with you this morning and to hear the address of the president. I know just how much hard work it takes to get out a president's address, and I am very glad that Dr. McCreas' address has been so warmly received. I read a president's address about a month ago which was not received so graciously. I am glad to compliment the president. I think we all recognize the members who love their society. We know them from the fact that they come the first day and stay until the close of the meeting, while we know that those members who come in late and stay perhaps just one day are not so much interested. I think action should be taken on the matters suggested by the president, because they are needed to make the profession what it ought to be and bring it up to the high position it ought to occupy. It is usually said we should not carry politics into a dental society, but I think the more we have of the right kind the better, and if thereby the valuable suggestions of the president could be carried out politics would serve a good purpose.

Dr. Geo. S. Todd:

The only point in the address to which I might possibly add something is in relation to keeping up the standard, and one of the safeguards we have in doing that is our state laws of which the Doctor made mention. In case of danger when those laws are threatened, our association ought to rise as a political body to prevent it. We have had cases like that in two sessions of the legislature when I think the association rose to the emergency in a proper way. As long as we are trying to attain a high standard there will be those who are not going to be able to reach it, and they are going to try to knock out our laws, and this is one of the stones we have to build upon. The legislative committee we have at present, and I think the chairman is the same we have had for a number of years, has been doing noble work. He has been constantly in the field this past year watching everything carefully and embracing every opportunity to safeguard those laws, and the united support of the whole association ought to be extended to him whenever he needs assistance.

Dr. J. W. Penberthy:

I do not know that I can add anything to what was said in the paper. Certainly education is the only line along which we can work and hope to advance ourselves in the profession. As has been said by Dr. Kremer the curriculum of our colleges must be advanced, but we members must also advance. We have got to back up those that are already out of college and they must advance themselves. So far as the fee is concerned a man must educate himself to the better accomplishment of everything he does in his office, and if a man is capable of accomplishing a certain labor better than someone else he naturally will raise his own fee, and he does not have to ask his co-laborers to raise his fee for him. The better qualified he is to do his work the greater remuneration he will receive. There are other points the president touched upon that are very valuable and that I shall take pleasure in reading when the address comes to me in print. I would like to say in addition that every member of the association should constitute himself a committee of one to promote the welfare of the organization and endeavor to increase its membership.

Dr. J. F. McCrea (Essayist):

I do not think I have anything to add. The members seem to have taken everything I said very kindly and I appreciate it. Dr. Kremer made some remark about elaborating on the questions, and I admit that some subjects might have been elaborated considerably, but that was not my purpose; it was merely to suggest things, without detailing any plan. I believe if we keep these things in mind and work in that direction we shall evolve the problem naturally, and if I had attempted any elaboration it would have added a great deal to the length of my paper without, perhaps, adding to its value, because a paper of this kind should necessarily be brief without going into the details of subjects. Unfortunately we can never have a large attendance at the first day's session, although I believe the by-laws provide that the president's address shall appear on the program of this first session. The attendance is usually so light that the occasion would seem to scarcely call for a lengthy paper, and all I tried to prepare was simply a short talk.

THE ODONTOLOGICAL SOCIETY OF CHICAGO.

A regular meeting of the Chicago Odontological Society was held at the Wellington Hotel, on Tuesday evening, April 10th, at 8 p. m.

The President, Dr. Hinkins, occupied the chair.

Dr. Casey Wood delivered an address on the "Care of the Eyes by Members of the Dental Profession."

DISCUSSION.

Dr. C. N. Johnson:

I am sure I express the sentiments of our Society when I say that we are very appreciative of the excellent discourse we have listened to from Dr. Wood. It seems to me that every word of advice he has given us ought to be seriously considered. If his advice were followed, very many dentists would be saved serious trouble. There is no doubt that the good service of the eye is of the most vital importance to dentists, and what he has said in regard to the dental student appeals to me very strongly because I have encountered in my college experience students who, after a year or two years, faithful work have found that their eyes were not made for dental practice. It seems to me that in the early stages of student life in the dental college that this matter of the training of the eye and the condition of the eye should be carefully looked into by the college authorities because that is the only way we can get at it. The average young man grows up without much attention to the eye unless he has some difficulty with it, and sometimes by the time that develops it is too late to remedy it and make him an efficient dental practicioner.

I also wish to emphasize what Dr. Wood has said in regard to the abuse some dentists give their eyes. I remember some years ago, when I was practicing in the Opera House block, the whole front of the room where I operated was of glass. I was under the impression that the more light a dentist had, the better it was for him. I remember on one occasion Dr. Brophy said to me: "You are going to ruin your eyes because you have too much light here." A few days after that, my friend, Dr. Henrotin, made the same remark. I closed one window entirely with a shade and operated with the light from the upper half of one sash. When I made arrangements to go into the building where I am now, one of my professional friends telephoned me and asked if I had seen the windows. I told him no, but I knew the dimensions of them. He told me to go over there and climb up a ladder and look at the windows and I would cancel my lease. I did go over and look at the windows, and I concluded that they were just what I wanted. The windows are not large, but are placed high up, and the light comes directly in the patient's face and there is no light shining in the operator's eyes. I have gone on there now about thirteen years operating in that room with the greatest possible comfort. I have the walls in a dark color and no cross lights.

In the course of my lectures at college in the senior year, I take this matter up with the students, and tell them the experience I have had in the past. I remember in those days when I was using so much light that I did have some trouble, but since then I have never had any trouble. I have not had that peculiar tension on the eyes.

I want my light right in the patient's face, and I don't want a light wall opposite me. I want no reflected rays, and I think the dentist who operates in a bay window makes a great mistake.

Dr. Davis:

This is a matter that has caused considerable thought on my part in the last few months, because I have just got beyond that point when ordinary plain eyesight is sufficient. I don't know whether I have ruined my eyes by too much light or not. I have been practicing twenty-two years in Chicago, and have always had plenty of north light. I believe in being able to get plenty of light if you need it, and you want plenty of light whether it is artificial or natural sunlight.

I should like to ask Dr. Wood at this time whether the monocle of the jeweler is of any value to the dentist because I have known of several dentists who have got into the habit of using the jeweler's monocle, and they think it works very successfully.

We all abuse our eyes very much, and probably the fact that I have been able to go so long without glasses is because I have been doing as the doctor advised, and have got away from dentistry every opportunity I could. I do not allow dentistry to interfere too much with pleasure, nor do I allow pleasure to interfere too much with dentistry.

I want to thank Dr. Wood for what I have heard tonight, and wish I could have heard his remarks twenty years ago.

Dr. Nevreze, Paris, France:

I am very glad I have heard this interesting discourse from Dr. Wood, because we in Paris are anxious to get offices with as much light as possible, and they are putting in prismatic glasses in the windows. I would ask Dr. Wood about that because I am to be a practicioner in a few months.

Dr. J. H. Woolley:

I am very glad to have had Dr. Wood with us. He seems to have the illuminated word and has given us light. This question of light is one not only for the dentist, but for the schools. I am perticularly interested in the book that he has written on "The Common Use of the Eyes." That part relating to school life, I think, has done a great deal of good, and I think a reprint of the part on light should be issued for the public in some way.

My eyes are doing excellent service, and I think it is owing greatly to the advice my father gave me; he being a physician, paid some attention to my student life. I have a similar arrangement to Dr. Johnson's as to light. I also have two shades, one to the right and one to the left, and secure light directly from the north, striking the patient's head, with no intervening light. It is surprising to find how much should be done to what is supposed to be a finished cavity if the dentist, after he is through with his instrumentation, will take a magnifying glass and observe the walls critically. Right here I want to ask Dr. Wood a question. I am thinking of darkening my paper back of me to the right and left, and putting a very light paper above so as to relieve the darkness and give me certain rays of light coming down on the chair. I want the room darkened in the rear and have a beautiful clear ray of light coming in direct. I think Dr. Brophy and some other gentlemen who have been in Paris may know a dentist whose room is entirely darkened with the exception of light coming direct from the window to the patient.

I think an individual can hardly ever grow old if he will study the laws of health. The mismanagement of the light helps to break down the physical system because I think reflex troubles often come from defective eye-sight.

Dr. T. W. Brophy:

I was one of those who voted most enthusiastically to extend an invitation to Dr. Wood to be with us this evening and I am very glad indeed that he has found it possible to spend the evening with us. When Dr. Wood said that more than any other sense, the eye-sight is important to the dentist, he expressed exactly the fact. The sense of touch is of very great importance to the dentist, but after all if it were not for the fact that he has good vision, he could not practice his profession.

I am one of those who in the past indulged in the abuse of the eye in the way that Dr. Wood referred to. My first great mistake is one that is often made. The mistake I made was in having two windows opening in different directions, for the purpose of lighting my operating room. I did not know enough to realize that that was a very bad arrangement. On this line, I should be very glad to have something in Dr. Wood's closing remarks as to the effects of cross lights on vision. Like the boy at college who said he knew his examination, but he knew it too late, I knew too late that that was not a desirable light. When I found that it was improper, I at once corrected it, and I felt so deeply on the subject that I set myself to do what I could to prevent others making a similar mistake. It was about this time that I was in Dr. Johnson's office and saw him making a tremendous blunder in allowing a volume of light to enter a room that deluged it, and created a glare and reflection from the walls that was absolutely destructive to vision, especially when concentrated on so small an area as the dentist must observe in his work. I set myself to write a paper on the subject of light about which I knew but little, but I thought I could do something that would be of benefit to my fellow practicioners, and I invited Dr. Johnson, who was not at that time a member of our society, to come over as my guest.

I am also one of those whose case is described by Dr. Wood. When I was in the habit of going to Mackinac Island every summer, I was able to read the name of a ship at a greater distance than almost any of the others. I thought that was evidence of excellent eyesight, but perhaps that fact, together with the fact that I worked all the time from early morning till late at night, and then worked at home till towards the next morning, was the cause of my straining my eyes. Then I had a habit of preparing lectures, essays, etc., on the street cars. My eyes began to be painful, and I went to Dr. Holmes and he adjusted some glasses which helped me.

One of the features of eye defect is that 75 per cent of the young men who have never paid much attention to their eyes do not know that there is a defect. They suffer from eye strain, feel fatigued, and the whole system is in sympathy with the eye, but they do not know the cause of the trouble. I have been impressed this evening with the thought that we are negligent in our duty as college men and have not done our full duty to the students in impressing upon them the necessity of having their eyes examined.

When I was in Germany last summer I took occasion to visit the municipal dental infirmary at Strassburg. All school children whose parents are unable to employ a dentist must go to have their teeth examined and put in good order. That applies as well to the eye and ear. Germany leads us far in this respect.

As many as fifteen years ago when Mr. Bright was at the head of the schools in this city, in a conversation with him I told him a serious mistake was being made in the schools in the management of light. When I was a boy we used slates and the slates did not reflect any light. Now the child is forced to use white paper and perhaps placed in the room so that the paper would act as a mirror. I have not any doubt that Dr. Wood has had scores of cases brought about by that condition of things. If it is necessary to use paper, let the paper be dark. I do not know of anything that this society has done recently that is of more value to ourselves as well as to others, than having Dr. Wood give us this talk, for when it is printed it will have a tremendous audience, and will be of benefit to many. In the conclusion of his remarks I hope he will explain so that it may get into the report, how those who are suffering from the indiscreet use of their eyes may correct the defect, and he will confer an inestimable benefit on many people whom he does not know and probably never will know.

DR. J. G. REID:

One thing that has pleased me very much is the pleasant way in which Dr. Wood introduced himself to us and to the dental profession by saying that we ought to be closer together. It impressed me in such a way that I shall not forget it. No technicalities were indulged in, but a plain, common-sense talk, which is useful and practical.

Dr. Brophy referred to cross lights. I have had experience with the cross light and I will relate it. I was about thirty-five years old and I was using a north light, and there was a west window in the corner. Both windows were the same size and my chair was right between them. I discovered that my eyes would begin to get tired and I would have to stop and look across at the building opposite to rest them. In the course of half an hour this difficulty would occur again. Finally I consulted an oculist and he instructed me that my eyes were all right. I went away relieved, but the next day the difficulty arose. That continued about a year and I had headaches which were very annoying. When I got away from the office I was all right. I went back to the oculist with the same result. One day it dawned upon me that I would put a shade on that west window. There was no reason why I should do so except that the sun was rather hot in the afternoon, and I put a white Holland shade on the window and kept it down all the time. It wasn't three weeks until I had forgotten that I had ever had trouble with my eyes. When I was about forty-two the lens of my eye became flattened and had to be shortened up with glasses. It was a pleasant sensation to put glasses on my eyes. It was delightful to have the aid of the glasses in my work. I don't read any fine print except the newspapers. I operate usually with the light on my back and directly on the patient.

Dr. E. A. Royce:

I wish that I had heard Dr. Wood's remarks about twenty-five years ago. The idea of a young man going into a profession where the eye strain is absolutely constant knowing nothing whatever of the condition of his eyes, is something that has occurred to me as being absurd. It took me a number of years to find out that my eyes were not first rate and to find out just exactly what they needed.

I operate at a window the same size as Dr. Johnson's. I was obliged last summer to change from a north to a south window, which gave me direct sunlight. I tried a white Holland shade and I found it exceedingly disagreeable. I tried to soften the light by putting on a thin green silk curtain with a shade. That was quite a relief. I have not entirely discarded the white Holland, but almost entirely. I operate with a dark shade dropped from the top just far enough so that the sun won't shine in, and get my light from above the shade. It is so dark on the bracket that my assistant says she can't tell where to put the instruments. I operate with a great deal of comfort and am somewhat better pleased with a south window than I was with the north window.

Dr. Wood's talk, as Dr. Brophy has said, is not only to the audience here. This society is but a very small fraction of the number of people that will be benefited by the most practical talk on this subject I have ever had the pleasure to hear.

Dr. E. J. Perry:

I simply rise to pay my compliments to the essayist, and I will not weary you with a long speech. It was a splendid thing to hear Dr. Wood state, not opinions, but facts. We can rest right here on these things he has told us about light and the use of our eyes. I, too, have that friendly feeling towards Dr. Wood. I warmed up to him when he made those remarks about the kinship of our specialties, and I feel toward him as I do towards members of this society, and I am deeply grateful to him for coming here.

I think it would be a good thing if someone in authority who would be listened to, as Dr. Casey Wood would be, would say to the authorities that white paper for children is a very bad thing on account of the reflection of light. It is the most distressing thing to have light reflected back in the eyes.

Dr. G. W. Cook:

There is one thing that was impressed very forcibly upon me by Dr. Wood's remarks, and that was in regard to the dental student's eyes. I have known students in the brief period I have been teaching who have given up the practice of this profession absolutely because of defective eyesight, which they knew nothing of until after they had begun the study of dentistry.

We hear discussed the question as to what kind of light is best, but I think Dr. Wood has made it plain that we are perhaps using too much light after all.

Dr. Wood's simplicity in presenting this talk and bringing out some very important points is certainly very pleasing, and I want to thank him. I fully agree with him when he says that we who are members of the same family of healing arts should get together a little more frequently than we do.

Dr. E. R. Carpfnter:

There are a couple of things that were suggested to me during the evening, and one is the question of reflected light. In the matter of decorations in the operating room, I think it is generally conceded that green is a good color. I have had it on my walls for a number of years and have become satisfied that olive green is the most comforting color. I have discarded kalsomine and paint and have had the walls covered with ordinary burlap of an olive green shade and the ceiling of a lighter green.

Another thing that does a great deal of harm to the average operator is the mouth mirror. I found that my eyes at night were frequently very tired and I made up my mind that the mirror was accountable for it. We were obliged to work in it in college, but when I left college I used a mirror throw light on my work and not on my eyes.

Dr. Reid brought out one point that I had in mind, and that is that I work with my back to the light as much as possible.

I wish to thank Dr. Wood for his agreeable and instructive talk tonight.

Dr. J. E. Hinkins:

The question of light is one that is of great importance to us all. My experience has been that I had a north light with a large window, and after about five or six years I became rheumatic, my eyes went back on me, and I was fortunate to change off to an east light. I also have a bay window. The side windows are twenty-four inches wide and seven feet long. One is to the south and the other to the north. I went through the history of shades and finally resolved on a dark, heavy green shade adjusting it to keep the sun out of the face of the patient. I have had pretty good eyesight all my life, and have had no trouble with cross lights.

The thing that has caused me the most trouble is this electric furnace. I had no trouble with my eyes until the question of porcelain came up. I could not make a good bake of porcelain with gold, so my friend, Dr. Goslee, suggested to me that I never would have a nice glaze on my porcelain until I watched it for the iridescence. He said to watch the porcelain until I saw that, and I would get nice bakes. I did, and two years ago I had my first trouble with my eyes. Since that time I have been having a good deal of trouble. I have enjoyed Dr. Wood's talk very much and feel well repaid for being here.

DR. T. W. BROPHY:

May I ask the doctor two questions before he begins? The late Dr. George H. Cushing advocated the use of chocolate colored papers in the operating room as in the case of Dr. Bing, of Paris, who uses a tube that brings the light into the room. He shifts this tube about but he himself stands in the dark.

The other point is when the time of life comes about forty-five, when glasses are usually adjusted, is it better for your patient to wear glasses continually or only during close work?

DR. CASEY WOOD, in closing the discussion, said: I am greatly obliged to several members for again referring to the all-important subject of *illumination;* it is well worthy of discussion by all of us who are engaged in tasks that require such constant employment of our focussing apparatus. If the dentist could always choose the best light for his purpose it would, generally speaking, be a north light, shining into an operating room in the top story of the tallest building he could find—thus obtaining all the year round and most of the day, that soft, diffused daylight which, all things considered, is best for his work and is easiest upon his own eyes. An east or south light has some advantages in a smoky city like ours and for winter work. The direct rays of the sun thus obtained can generally be modified by cream colored shades—although even this arrangement has its objections. In any event the *direct* rays of the sun should not be allowed to shine into the mouth of the patient, not only because the teeth give reflections that dazzle the operator, but because in using the mirror an entirely too strong illumination is the result.

While we are on the subject of mirrors I suppose they cannot be dispersed with, and yet I regard their use as one of the principal sources of eye-strain in dental work. While it is true that during the working period the light is most of the time simply reflected upon the teeth and oral walls it is, now and then, flashed into the eyes of the operator to the distinct detriment of these organs. That is to say, the dentist is straining his eye to see microscopal objects and at the same time throwing strong light upon his tense choroid just as—to compare small things with great—one runs an "obstruction" race.

The *wall tints of the operating room* have an ocular value, and should vary according to the kind and amount of the general illumination. If a north (or west) light be generally used dull cream, light buff, or light green paper, paint, calcimine or burlap may be used with benefit. If the light be from the east or south, still darker tints are unobjectionable. In other words, while always using soft, *unglazed* colors these may be made to vary with the intensity of the light admitted to the operating room—the brighter the illumination the darker the wall tints. Let me repeat, glazed paper, or other objects that strongly reflect light into the eyes of the operator should be banished from the dentists's operating room.

You may easily imagine, then, my opinion of the method of *illuminating the oral cavity employed by Dr. Bing, of Paris.* As you know, he operates in a dark room, the only light admitted being that conveyed by means of a movable tube to the face of the patient. In my judgment this is an ideal arrangement so far as the eyesight of the dentist is concerned. There may be extrinsic objections to it, but it affords, in great measure, the best form of illuminating the mouth with the least expenditure of energy by the ocular apparatus.

The *use of the monocle* or loupe in dental work is, to my mind, objectionable. It usually argues the possession by the dentist of defective eyes, defective eye muscles, or incorrect glasses. There is, in other words, generally something wrong with his binocular vision when the operator is driven to the use of a magnifying glass before one eye only. Such a device deprives him of stereoscopic vision and is, in several ways, a source of strain to both eyes. Better consult an oculist and see if the total visual capacity cannot be more satisfactorily increased by improving his binocular vision.

The *light from Luxfer prisms,* or similar devices, is not satisfactory in dental work. These prism "batteries" are of great value in lighting dark basements or the interior rooms of city buildings, but they have no place in the dental operating chambers that should always be outside or corner rooms with a good sky exposure.

The same judgment must be passed upon *cross lights.* The illumination of the dental chair should be, preferably, from one window placed above the level of the patient's face. Equally effective, of course, is it to cover the lower part of a deep window with an opaque shade allowing only the light from the upper portion to shine upon the field of operation. In other words, the best effects are obtained from a sufficient light falling from a comparatively small aperture upon the mouth of the patient, the rest of the room, as well as the dentist's face, being in comparative darkness.

The questnon whether the dentist's glasses should be worn constantly or only when he is doing near work, will entirely depend upon a number of considerations. If he is decidedly astigmatic or farsighted, or has weak eye muscles, or is not in the best of health, or suffers from eye symptoms due to strain when going about, he ought to use these aids to comfortable vision all the time. If, however, there is no strain upon the ocular apparatus or nervous system except during periods of close work, then near glasses are all that he needs.

THE DENTAL REVIEW.

Devoted to the Advancement of Dental Science.

PUBLISHED MONTHLY.

EDITOR: C. N. JOHNSON, M. A., L. D. S., D. D. S.

Subscription price $1.00 a year including postage, to all parts of the United States and its possessions, Cuba, Canada and Mexico. All other countries $1.75 a year.

EDITORIAL.

THE FIFTIETH ANNIVERSARY OF THE ST. LOUIS DENTAL SOCIETY.

On November 10, 1906, the St. Louis Dental Society celebrated by a banquet its 50th anniversary. The occasion was one never to be forgotten by those who were fortunate enough to be in attendance. The day was spent in entertaining the guests from out of the city, and everything possible was done for their pleasure and comfort. The banquet was held in the evening at the Planters Hotel and was very largely attended. The speeches were of an exceptionally high order and were most enjoyable—some of them dealing with reminiscences of the early days of the society and with the characteristics of the men who were the organizers and first members. It was impressed upon every one present that the group of practitioners who were active in the progress of the profession in St. Louis in those days were men of superior attainments not only in professional ability but as cultivated gentlemen. They left such an impress upon the community so far as dentistry was concerned that their influence is still felt. It is doubtful if in any other locality there were at that time a larger body of men of equal attainments, or men more in earnest in promoting the welfare of dentistry, and if those men could have been brought together at that banquet board and listened to a recital of what our present day dentists think of their early labors they surely would have felt repaid for all their efforts.

A 50th anniversary of any organization means something. It is significant of stability, steadfastness and devotion to a common purpose in life. A dental society which has rounded out fifty years of continued effort is entitled to great respect, and its full measure of usefulness can not well be overestimated. No one left that gathering without an exalted idea of the possibilities of society effort, and without a pledge to himself that he would do more in the future than he ever had in the past toward the upbuilding of a profession whose traditions of a half century ago had been so vividly recalled on this delightful occasion.

THE DENTAL REVIEW FOR 1907.

It is almost bewildering to contemplate the flight of time in editorial work, as in all other work. It seems but day before yesterday since the announcement for 1906 was written, and yet in that time we have published 1302 pages of matter in this journal. We are not quite satisfied with what we have accomplished in the past year, because to be perfectly satisfied is to stand still, and this is not one of the numbers on our program. THE DENTAL REVIEW was never so prosperous as it is now, but this brings us to a realization of the fact that at no period in the history of any organization or any enterprise is there greater need for renewed effort and concentration of energy than at the high tide of prosperity. It is often said of an individual that he can not stand prosperity, but the publishers and editors of THE DENTAL REVIEW are going to try very hard to stand it. Their aim is to improve the journal in such a way as to increase its usefulness and thus insure its continued prosperity. The year 1907 promises much in store for our readers, and we enter upon the new volume with great encouragement and a high measure of hopefulness.

We are under one lasting obligation which we wish to acknowledge. Our contributors and readers have come to our support during the past year in a manner which has had much to do with the success of the journal, and they have our especial thanks. With the same loyal support in the future we shall produce a better journal, and accomplish a greater good.

THE EDITOR'S DESK.

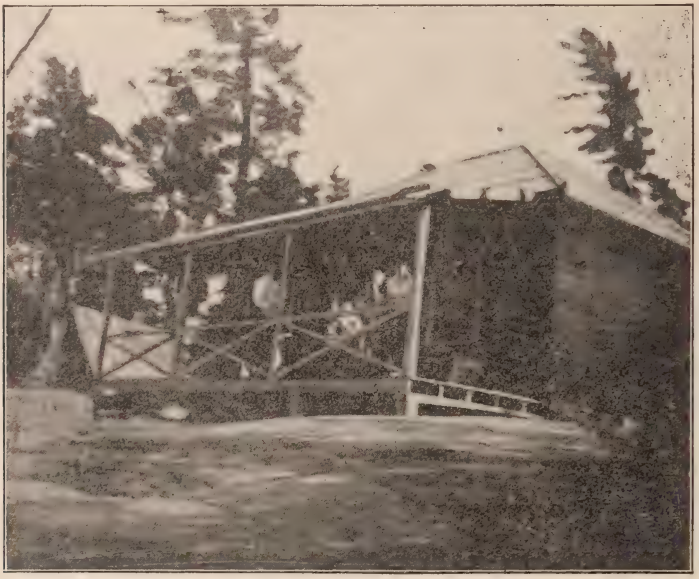
ANOTHER VACATION.

[Continued from November DENTAL REVIEW.]

ESTHER ISLAND AND "THE PINES."

The name of the cottage on Esther Island is "The Pines" and it is a very appropriate one. The spot is beautiful and wild, which makes it full of rest. Those on the island besides our own party were Dr. and Mrs. Cunningham, their son, Lorne, and "Jimmie" and "Sailor." Jimmie was the Scotchman who was the doctor's man-of-all-work, and Sailor was the dog. The cottage is built on a high, table-like rock, and it was well that it had a good foundation as we found later. The island is about seven acres in extent with immense possibilities of equipment. A boat passes both ways daily between Parry Sound and Pointe au Baril, and this is the sole intrusion of civilization. We spend the time fishing, rowing, cruising in the "Emerson," bathing and eating. I hadn't been "in swimmin'" before in twenty years, but "once a swimmer always a swimmer," and it came as natural as if I had only come out of the "old swimmin' hole" the day before. The bathing place for the children was a basin formed by a shoal of rocks inside of which the water was only four feet deep and quite warm, while just outside it was fully fifteen feet and very cold.

But to me the fishing was the best fun. I had covenanted with the master and mistress of "The Pines" to keep the party in black bass, and as we were the hungriest crowd I have ever encountered, the contract was no small one. But I stood up to the task with strange cheeriness. I shall never forget my first fishing expedition at "The Pines." Dr. Cunningham contended that my clothes were too good to go fishing in, and generously volunteered to lend me a pair of old pants. I never was placed in such a dilemma. The pants were handed me and, of course, I was duty bound to honor the courtesy of my host by wearing them, but when a man who measures between three and four feet in circumference at the equator tries to get into a pair of pants made for a man who measures eight or ten inches smaller, there is certain to be a discrepancy. I found the legs at half mast a trifle below the knees, but I didn't mind that. What disturbed me most was the girth. The two ends of the waist band were straining their eyes in vain to catch a glimpse of each other across a dreary expanse of convex shirt front. When I tried manfully to bring them into speaking distance I was reminded of nothing so much as a huge V-shaped interproximal space with its apex looking toward my toes and its base flaring out in the direction of my elbows. I was discouraged—but game. I determined to wear those pants and please the doctor, no matter at what risk or sacrifice, so I got a rope and laced the front *a la* corset across my manly form. When the doctor saw the outfit and realized the extent of my loyalty to him, he was so nearly overcome with emotion that I thought I should soon have a case of spasms on my hands. He rolled around on the porch holding his sides and he rolled off the porch and then he rolled some more till I was afraid he would roll down the rock into the bay. When he recovered himself sufficiently to listen to reason, I said to him appealingly that the only one other thing he could do for me to complete my happiness was to provide me with a corset cover.



"The Pines," Esther Island

But even this did not seem to affect the fish. The black bass is a game fish to catch when he has his fighting clothes on and I had many a rare tussle with them. But one day the Collector out-did me in the way of a catch, and she hasn't finished talking about it yet. I had been out to one of the other islands with Lorne and Jimmie and we had picked up a few nice ones and were rowing home. The dock at "The Pines" is only a few yards down the embankment from the cottage, and as we approached I heard the shrill voice of the Collector calling out: "Oh, Papa, I bet I caught a bigger bass than you, and I caught him all by myself from the dock—and—," but she chattered on so fast that I lost the combination and cannot report all she said. When we landed she corroborated her statement by gleefully holding up her catch, and he was surely a beauty. We had no scales to weigh him, but he measured over fifteen inches in length and was round and plump.

The Bathing Basin at Esther Island

I found it impossible to sleep in the morning at "The Pines," and was usually out of bed shortly after four o'clock. The music of the birds, the rustle of the early breeze among the trees and the miracle of the morning sun upon the water proved too great an attraction, and I was either out on the porch, poking around among the trees, or down on the dock casting my line. One morning Jimmie, who was also an early riser, suggested that we row across to another island in sight of "The Pines" where some rocks jutted out over the water, and try for bass. The prospect looked good and, of course, I said "Yes."

The Collector, and her catch

Those who have never taken such a trip in the early dawn have missed something worth while. I shall never forget the beauty of that morning, and I fear I proved an indifferent fisherman. The birds were at their best and I heard one song that was entirely new to me. It was a long series of notes pitched rather high and poured out as if from the very soul of the little warbler, then dropping suddenly at the end to a low and tender cadence that was inexpressibly sweet. Jimmie had made fast the bow of the boat and was on the rocks casting his line, while I still sat in the stern listlessly dangling my hook in the water, more intent on the songs of the birds and the scenery than I was on the fish. But I was soon brought out of my reverie by a vicious tug at the line and I saw at once that I had a fight cut out for me. It was useless trying to manage him from the unsteady boat and so I made for the rocks, all the while keeping the line taut. He darted back and forth cutting the water with the line and keeping me on the alert watching him. Suddenly he swerved and made in my direction. This was what I was waiting for. I helped him along a little faster than he had counted on, and before he knew it I had lifted him clear of the water and landed him safely on the rocks. If you want anything more exciting than this you will have to grow a new kind of fish. We had good luck that morning. Jimmie, always quiet and never wasting words with anyone, was on the far side of a rock which hung above the water ten or twelve feet. I could not see him, but I heard him scuffling with one, and from the sounds I soon became convinced that he had caught a tartar. After a few skirmishes I heard a splash as the fish came out, followed instantly by the snapping of the pole. When the pole broke I despaired of Jimmie saving his fish, but he managed to seize the line and landed him. He was a beauty—one of the largest we caught while at the island.

We got back to "The Pines" in time for breakfast and when I held up the string of fish to the Mater she said: "Well, you *did* catch some beauties, *didn't* you? But, don't you ever go off in a boat like that again without saying something about it. I've been frightened nearly into fits ever since you left, imagining something had happened to you." Dr. Cunningham turned to me with a twinkle in his eye, and asked: "Do the children snore?" I said: "No, unless it is Elizabeth, and the only noise I ever heard her make was the squeaking of her joints when she is wakened up or laid down." "Then," said he, "the case is serious. The Mater must have been *over-wrought with anxiety* about you, because I distinctly heard snoring coming from the room where she and the children were most of the time you were away."

"Well," said the Mater, with some spirit, "you don't suppose I'm silly enough to lie awake at such an unearthly hour as that merely because I am anxious, do you? Besides, I don't snore, anyway." She added as a clincher.

(*To be Continued.*)

BOOK REVIEWS.

THE AMERICAN ILLUSTRATED MEDICAL DICTIONARY.

The new (fourth) edition—2,000 new words. All the terms used in Medicine, Surgery, Dentistry, Pharmacy, Chemistry and kindred branches; with over 100 new tables. By W. A. Newman Dorland, M. D. Octavo of 836 pages, with 293 illustrations, 119 of them in colors. Flexible Morocco, $4.50 net; thumb indexed, $5 net. Published by W. B. Saunders Company, Philadelphia and London.

This is a very attractive volume, with some of the best illustrations we have ever seen in a medical dictionary. We notice a laudable tendency in recent issues of dictionaries to simplify the spelling of some of our technical terms. For instance, it is now "anesthetic" instead of "anæsthetic," "dentin" instead of "dentine," etc. Some of these changes jar slightly on the habit of mind of one who has long been accustomed to the older terms. It is difficult for some of us to drop the "e" in "dentine," and personally we have never read any good reason for doing it, though we may eventually have to bow to the mandates of our lexicographers. In the 1903 edition of Gould we find "dentine," but in 1904 it is given "dentin" or "dentine." One word in our profession seems to require a definite status. This is the word "cement." We have latterly been taught that the noun should be pronounced "sem'-ent," and the verb "se-ment'"; in other words, that we "ce-ment'" a thing with "cem'-ent." But both Dorland and Gould do away with this arbitrary distinction and give the long-used pronunciation "se-ment'"—accenting the second syllable in the noun. This is the pronunciation employed by probably nine-tenths of the individuals who are accustomed to using this term, and it would seem well, unless there is some very good reason against it, to let the old pronunciation stand. This edition of Dorland is well worthy a place in every dental library.

A SYSTEM OF DENTAL SURGERY.

By the late Sir John Tomes, F. R. S. Fifth edition, revised and enlarged by Charles S. Tomes, M. A., F. R. S., and Walter S. Nowell, M. A., Oxon. 318 illustrations. 780 pages. Price, $4.50 net. Published by Blakiston's Son & Co., Philadelphia, 1906.

It is now nearly fifty years since the first edition of Tomes'

Dental Surgery was offered to the profession, and the work has become truly a classic. In the light of the most advanced methods there are some of the technical procedures advocated in this volume which might be modernized to advantage, and yet it would be expecting too much of any work embracing so wide a range of subjects to look for perfection in the detailed description of operations. The most impressive part of the work relates to the consideration and illustration of abnormalities of the teeth and mouth. Some of the cases described and shown in cuts are intensely interesting and instructive, and are well worthy of careful study. The name of Tomes will live as long as dentistry has a literature.

DOMESTIC CORRESPONDENCE.

MT. CARROLL, ILL., Oct. 19, 1906.

To the Editor of THE DENTAL REVIEW:

I have just returned from a meeting of the Northern Illinois Dental Society, and I cannot resist writing to THE REVIEW about it. We led off with the president's address upon the subject of practice building, and it seemed to me that he left nothing out of it that would be of use to the practitioner. He was requested to have the principal points printed as a reprint from the proceedings and send one to each member of the society. Those who were not present may drop a line to Dr. F. E. Cheeseman, Chicago, Ill.

Dr. G. W. Haskins read a paper on the "Roach Moldable Porcelain," and we just had a good time discussing it. All kinds of questions were asked and answered without hesitation, and to the majority very satisfactorily. The next morning there were clinics, demonstrations and exhibits of the material in and out of the mouth.

The members who failed to attend missed a great treat by not hearing Dr. F. B. Noyes on "Some Phases of the Problem of Tooth Caries." Every one in that large audience sat still, listening intently to the learned discourse, and it was 11:30 p. m. when we got through talking about it.

I have spoken of these three papers as being par excellence, and those who were absent are advised to read carefully the published proceedings.

The clinics were up to the standard in every particular.

Our society is the best of its kind in the United States. It is only nineteen years old, but it has done more work than many other societies much older.

We meet in Rockford next year. Dr. C. L. Snyder is president. We are growing in ability and numbers. Come and join us next time we meet, October, 1907. JAMES W. CORMANY.

NEW YORK LETTER.

To the Editor of THE DENTAL REVIEW:

The opening dental meeting of this fall occurred Tuesday, October 2, when the New York Institute of Stomatology held its monthly meeting at the usual place, the "Chelsea," in West Twenty-third street.

Prof. R. H. M. Dawbarn of New York, presented a patient, a lad of eleven years, to show the results of "an operation for double hare lip—also trachelloraphy and staphyloraphy." The lad was able to speak quite clearly, so that he could go to school. The results of the operation for the double hare lip seemed marvelous.

Dr. Herbert L. Wheeler of New York was introduced as the essayist of the evening, his subject being "The Need of an Independent Journal for the Dental Profession."

Dr. Wheeler spoke at some length on his views in regard to this matter, and especially of some events in dental journalism of the past few years, leading up to the "journal" now published representing the New York Institute of Stomatology, the American Academy of Dental Science, the Harvard Odontological Society and the Metropolitan District (of the Massachusetts Dental Society).

At the meeting of the Second District Dental Society, October 8, in the Kings County Medical Society building, Dr. I. J. Wetherbee of Boston, Mass., read a paper entitled "The Passing of the All Cohesive Gold Filling." His description of his method showed that it was much after Dr. Shumway's methods, except that Dr. Wetherbee lines the cavity with gold foil first, then introduces the tin foil and finishes with gold—cohesive, if need be.

Drs. Ottolengui, Houghton and Van Woert were prominent in the discussion, but all who took part got away from the tin and gold combination and spoke of porcelain inlays, gold inlays, *good* amalgam fillings, as various ways of avoiding the use of cohesive gold.

The executive committee referred to Dr. William Jarvie's retirement from practice recently and to plans for a banquet in his honor during the winter some time. In this same connection it is rumored that Dr. A. L. Northrop is about to or has retired.

These gentlemen have a long and honored career to look back upon.

We notice the death quite recently of Dr. Dwight M. Clapp of Boston, who was as well known there as any practitioner.

"The Extraction of Teeth a Surgical Procedure" was the title of a paper presented before the First District Dental Society at the first meeting of the fall session by Dr. M. I. Shamberg of New York.

The subject was a very nice argument in favor of placing the extraction of teeth on a higher plane, making of the operation a surgical one, with all the aseptic and antiseptic precautions.

Dr. Shamberg said: "Too many men slipshod the procedure, using no antiseptic measures. The very fact that deaths have been reported shows that the operation is not devoid of serious consequences."

Then he spoke about the "newer dental science," saying that only since it has sprung up have people been alive to the value of teeth. It has resulted in their attempting to save all teeth. The longer a diseased tooth is retained in its socket the more irritation, and it makes the operation of extraction more difficult; the bone is made more dense by inflammation. Teeth now are seldom removed for the purpose of relieving pain, all of which makes the operation of extraction quite different from that of years ago.

Dr. Shamberg also spoke of the several characters of troublesome tooth sockets; the traumatic and the dry.

He is of the opinion that mouths should be treated several days preceding an operation for removal of teeth, by use of mouth washes and sprays, this treatment being more important than that after. If a socket is not imperfect there is no need to care for it later.

In cases of infection he uses campho-phenique and iodoform gauze. Death due to hemorrhage after extraction he considers inexcusable.

He had projected on the screen an excellent collection of radiographs, showing varying conditions of tooth and socket inflammation, impacted molars and a few anomalies.

The discussion of the paper was opened by Dr. James F. Hasbrouck, who makes extraction a specialty. He emphasized all that Dr. Shamberg said as facts.

Dr. Shamberg treated the fracture of a root during extraction as a small matter, saying that its presence would cause little or no trouble, and might be removed more readily at a subsequent time when it had worked to the surface.

Dr. Hasbrouck did not believe in leaving a portion of root with a filament of pulp tissue or septic material in it, because it was often the cause of serious after-trouble. If abscessed, by all means remove.

Although a mouth cannot be made absolutely aseptic, it could be practically so, which is of great importance.

Dr. John I. Hart expressed the debt of the society to Dr. Shamberg for placing the extraction of teeth as a surgical operation.

He recalled the fact that while he was at college, twenty years ago, one of the professors, in all seriousness, spoke of the use of cobwebs as a styptic in cases of hemorrhage.

He asked the question: "Do upper gums heal more readily than lower?" Dr. Shamberg said later that he thought that due to gravity drainage that they probably do. Dr. Hart said if roots do break it is a misfortune only.

Some reference had been made to the burning of patients during the process of radiographing. Dr. Shamberg said of five thousand or so radiographs he had taken he had never had that mishap.

At the first meeting of the season of the Central Dental Association of Northern New Jersey, at Newark, on October 15, Harold S. Vaughan, D. D. S., M. D., of New York, was the essayist. "The Anesthetization of the Dental Pulp by Nerve Blocking and Pericemental Injection" was the title of his paper. Dr. Vaughan simply stated having witnessed a certain Dr. Kay of Norway, while on a visit here, perform certain injections of a secret formula for anesthetizing tissue, some of which were successful and some not. That he had experimented on thirty-one cases during the summer, with varying results, using stovain, eucain B—cocaine 1% and other solutions. Of the thirty-one cases he had had two failures. His deductions were that cocaine was superior in anesthetic power. A compound he recommends is composed of cocaine 1%, phenol, adrenalin, sodium chloride and sterilized water. This, he says, is the best he has used.

Nerve blocking consists of injecting an anesthetic in the region of a nerve trunk, such as near the mental foramen in the lower jaw, and in that way blocking the nerve impulse to the teeth supplied by that branch.

The paper was very nicely presented and very modestly, but was not altogether conclusive. Dr. Fossume of New York summed the paper in his remarks discussing it. "It may be the means of leading to greater things."

Dr. Lucky of Paterson said he did not see the necessity of anesthetizing such a wide area for removal of pulp. It was explained by Dr. Vaughan later that we wish to anesthetize the pulp for other operations than pulp removal.

Dr. Lucky thought it might be excellent for extracting several teeth.

Dr. Vaughn, in closing the discussion, acquitted himself quite ably by making some apologies for the manner of presentation of the subject. As to the question of pressure anesthesia, he has had more failures than successes. Sincerely,

"THE BOROUGHS."

PRACTICAL HINTS DEPARTMENT.

EDITED BY G. W. JOHNSON, D. D. S.

[This department is for busy readers. We want short articles containing practical ideas—the shorter the better. No article must exceed 200 words, unless of exceptional merit. Every dentist has some useful hint that has been of value to him, and if he will only put it in print it may be of equal value to others. That is what this department is for. Due credit will be given for every article sent. Address G. W. Johnson, THE DENTAL REVIEW, 55 State street, Chicago, Ill.]

Metal for Dies:—It was about fifty-five years ago that I introduced Babbit metal into the laboratory, and it remains today the only metal containing the five requisites for a dental die.—*L. P. Haskell, Chicago, Ill.*

Solution to Remove Stains of Silver Nitrate and Other Salts of Silver:—Ammonium Chloride, 1 part; Mercury Bichloride, 1 part; water, 8 parts. Apply and wash off with soap and water.—*W. H. Tweedle, Hopedale, Ill.*

Cleaning Files:—When a vulcanite file becomes clogged with rubber and plaster, it may be easily cleaned by wrapping absorbent cotton around it and saturate the cotton with chloroform. In about ten minutes it can be cleaned perfectly by the use of a stiff brush wheel on the lathe.—*V. P. Perisho, Streator, Ill.*

Mechanical Principles Applied to Cavity Preparation for Inlays:—Cavities may be so prepared in most instances that the prevailing stress acts to drive their fillings more securely into the cavity and when tried in place before cementing, the inlays may not be rocked or moved in the least. Such preparation clearly places the smallest amount of strain upon the cement and gains the greatest amount of retention in the cavity form—a state of affairs the inlay worker should always strive to attain to the fullest extent.—*J. F. F. Waltz, Decatur, Ill.*

Echafolta:—Echafolta is anti-venom and if taken internally and applied at once to wounds caused by bites of venomous serpents, reptiles and insects, neutralizes the virus so that scarcely any swelling or inflammation follows the trauma. Every dental practitioner is daily using explorer, excavator and bur. Points, edges and blades are sharp and sometimes wound soft tissues near. Infection carried to such a trauma by careless operator or patient (often the latter), and a full rigged "blood poisoning" may sail in. Who but the dentist should "clear decks" for action? Echafolta, safe, *sure.—A. C. Hewett, Chicago, Ill.*

Sterile Water:—I do not think dentists use sterile water as often as they should. I do not believe they use instruments that are surgically clean or sterile. We know by experiments that with many of the agents we look upon as antiseptics, it takes days in many instances to destroy the micro-organisms. Most of the contents of the water as it comes from the hydrant does not contain so many bacteria themselves, but contains the spores, and it is the spore development which is the thing we have to rid the water of in many instances, and if these spores are introduced into the mouth, ordinarily they find there the proper conditions for development.—*George W. Cook, Chicago, Ill.*

Bracket Table:—If you have a good cabinet you do not need a table with drawers. Have a table made of plate glass, fourteen inches square and one-half inch thick. The corners may be slightly rounded and the edges should be smooth. Have holes drilled and countersunk for screws to attach the table to bracket spider. The heads of the screws should be even with the upper surface of the glass. The advantages of this table are: Aseptic, neat in appearance, instruments four inches lower than old table; acids do not injure it; cuts off no light. I use J. & J. paper covers, which deaden sound of instruments and prevents them from rolling off table; and cone journal bracket.—*Benj. Bloxton, Richmond, Va.*

Danger in Administering Anesthetics:—There is one general principle that may be laid down regarding the administration of anesthetics from which we cannot deviate, and that is, no matter what anesthetic may be employed, whenever we bring a patient into the state of unconsciousness we are on dangerous ground. No one ever administered an anæsthetic with safety. I deplore the expression that is so frequently employed by manufacturers and their representatives that certain drugs or combination of drugs that are made up and sold may be used with absolute safety. There never was such a thing, and never will be such a thing, as absolute safety in the administration of any anaesthetic.—*Truman W. Brophy, Chicago, Ill.*

Treating Putrescence in Roots:—Many methods have been proposed to render gases inert. I have found that a crystal of monochloro-acetic acid will do this. In all cases of putrescence within a pulp chamber or root canal, by first isolating the tooth and washing its interior carefully with copper sterilized water, then partially drying it, I place a crystal block of the acid in the center of the pulp chamber, and if there is not sufficient moisture, a drop of sterilized water is added. Within five minutes the tooth may be sealed hermetically with cement. Leave the tooth alone for a few days and open it under antiseptic precautions. You do not need to be changing the dressing every day or two. The worst case of putrescence will yield after two treatments at intervals of one week.—*A. W. Harlan, New York, N. Y.*

Method of Baking Porcelain:—The average piece of porcelain is over-baked. I would also consider the filling had lost from one-half to two-thirds of its strength if my first bake was a glaze. All it ought to have is to be brought up to a sandy appearance, making it look as if it had been dipped in hydrofluoric acid. We have found that the temperature to which a piece of porcelain is subject in the furnace is not the only element that changes it, but the length of time it is subjected to the baking temperature is important also. Say that a temperature of one thousand degrees would be necessary to biscuit a certain piece of porcelain in five minutes. If another piece of porcelain similarly formed was to be put into the furnace and baked at eight hundred degrees for a much longer time, you would get the same results but at a temperature of two hundred degrees less. It shows if the first portion is under-baked it will be completed at subsequent bakings, while if glazed at first baking, that portion will be much over-baked before the inlay or crown is finished. If you will remember this you will get very much stronger porcelain.—*W. H. Taggart, Chicago, Ill.*

Superiority of Gold Inlays:—My idea is to prove in a purely theoretical, scientific way the superiority of gold inlays in large cavities in the posterior teeth, over all the other filling materials, even over the gold filling. Amongst others, one advantage of the gold inlay over the gold filling is that the cement we use in setting the inlay *hermetically* seals the cavity, and this is not the case with a gold filling. Even the best adapted gold filling never gives a chemical adhesion of the gold to the walls of the cavity, but always leaves a little crevice by which, even if it is microscopically fine, liquids and bacteria may enter. This crevice being hermetically sealed by the cement in case of an inlay gives us greater security against recurrence of decay. To have a practical proof of this I made an experiment, the result of which might be of some general interest. I took two molars with cavities of equal size and filled one with an inlay and the other with a very well adapted and carefully condensed gold filling. After finishing I placed the two teeth in a 5 per cent solution of eosin, which is one of the most penetrating coloring agents. After leaving in this solution six hours the teeth were taken out, washed, dried and sawed longitudinally in two pieces each. Along the cavity walls of the gold filling the eosin had penetrated to the bottom of the cavity, staining the enamel somewhat, and the dentine to quite a considerable extent. Along the gold inlay no traces of such a penetration could be seen. With this experiment I believe I have shown a considerable advantage of the gold inlay over the gold filling.—*Wilhelm Thiersch, Geneva, Switzerland.*

Offensive Breath and Its Treatment:—Although seldom, if ever, mentioned in dental papers, it is the writer's belief that an offensive breath is an existing condition (both among patients and the dental surgeon) of sufficient percentage and importance as not to be considered insignificant.

To begin with "A Foul Breath" may be due to a variety of causes, the most important of which may be said to be as follows:

First—Carious teeth.

Second—Food fermenting in the mouth.

Third—Digestive disturbance with constipation.

If, after eliminating the two first mentioned causes, by operative procedure and prophylactic manipulation respectively, we find that the condition still exists, let us first determine that catarrh of the nose or throat does not exist and proceed with the following instructions to our patient:

"Please, Mr. Blank, discard the use of cathartics, and in their stead, upon arising in the morning, lie upon your back and with muscle resistance, force your limbs up over your head for fifteen times or more. Following this, force your body up to a right angle position with the same amount of muscle resistance, keeping your limbs in contact with the floor for about the same number of times. This to be repeated before retiring; drink a couple of glasses of hot water before breakfast, eating an apple and its peel; breakfast to consist of cereals, preferably oatmeal, or eggs, or oatmeal and eggs; dinner should not be indulged in too heavily, bearing in mind that too much is worse than too little; supper should include stewed prunes, the following prescription to be lived up to:

℞	Pepsin	ʒiss
	Dil. Hydrochloric acid	ʒiii
	Aquae q. s. ad	℥iv

M.

Sig. Dessert spoonful in water t. i. d.

W. B. Sullivan,
Savannah, Ga.

MEMORANDA.

TO OUR SUBSCRIBERS.

We have recently had several copies of THE DENTAL REVIEW returned to us by the postoffice with the wrappers torn off. If subscribers have failed to get their regular issues we shall be glad to send the missing numbers if notified.

PENNSYLVANIA STATE BOARD OF DENTAL EXAMINERS.

The Board of Dental Examiners of Pennsylvania will conduct examinations in Harrisburg December 11-14, 1906.

For papers and particulars address Dr. N. C. Schaeffer, secretary dental council, Harrisburg, Pa.

DR. D. B. FREEMAN'S DEATH.

Died at Bethel, Vt., October 21st, Dr. Daniel B. Freeman, aged 64 years. Dr. Freeman practiced dentistry in Chicago since 1867. He served in the Tenth Vermont Volunteers throughout the war and was a past commander of George H. Thomas Post, G. A. R.

A NEW DENTAL JOURNAL.

Dental Practice, a new monthly journal, has just come to our desk. It is published in Toronto, Canada, under the able editorship of Drs. R. J. Reade and W. E. Cummer. The first number is a very creditable publication, and we extend a most cordial welcome to the new recruit.

LE MARS, IOWA, October 20, 1906.

THE DENTAL REVIEW, Chicago, Ill.:

Dear Sirs—Please announce in your journal that the meeting of the Iowa State Board of Dental Examiners for December 4th has been postponed until a later date. Yours truly, E. D. BROWER, *Secretary.*

DEATH OF DR. J. S. BOAK.

Dr. Boak died at his home in Martinsburg, W. Va., on October 4, 1906, aged 67 years. He was an old and respected resident of this place. He served with distinction in the Confederate army through the civil war and then took up the practice of dentistry and had followed it ever since in Martinsburg. One of his sons is Dr. S. D. Boak, dental surgeon, U. S. A., at Columbus Barracks, Ohio.

SOUTH DAKOTA STATE BOARD OF DENTAL EXAMINERS.

The next examination of the South Dakota State Board of Dental Examiners will be held at Sioux Falls, S. D., January 29, 30, 31, 1907, beginning at 1:30 p. m. All candidates for examination must bring diploma from reputable dental colleges or affidavit of having been engaged in the practice of dentistry for at least three years immediately preceding said examination. Instruments and material necessary to do all kinds of operative and prosthetic work will be needed at this examination. Vulcanizer and lathes will be furnished by the board. All applications must positively be in the hands of the secretary by January 22. G. W. COLLINS, *Secretary,*
Vermillion, S. D.

ALUMNI MEETING.

Twenty-fifth anniversary reunion, celebration and clinic of the Chicago College of Dental Surgery Alumni Association.

On the sixteenth and seventeenth days of January, 1907, the Alumni Association of the Chicago College of Dental Surgery will celebrate the twenty-fifth anniversary of the establishment of the college by holding a grand reunion and clinic. Arrangements have been made for a number of papers, a very extensive clinic, a theater party, and a banquet. A railroad rate of a fare and a third for the round trip from all points in the United States and Canada on the certificate plan has been arranged for.

A cordial invitation is extended to the general profession to be present, as well as all members of the Alumni Association and all graduates of the college.

R. C. Brophy,
J. P. Buckley,
Committee on Publicity.

PATENTS OF INTEREST TO DENTISTS RECENTLY GRANTED.

831,943. Dental handpiece. Chester M. Freeman, Brookline, Mass.

831,960. Artificial denture. Phillip B. Lesemann, Nashville, and S. J. Lesemann, Altamont, Ill.

832,528. Removal dental bridgework. Ernest C. Bennett, New York.

832,587. Artificial tooth. Robert Brewster, Chicago, Ill.

832,955. Dental plugger. Henry D. Bultman, New York, N. Y.

833,044. Dental instrument. Thomas Goodhugh, Sutton, London, England.

832,790. Machine for beating gold leaf metal. Jakob Heinrich and H. Dorsch, Furth, Germany.

832,975. Toothbrush holder. Eli J. Hyde, Spokane, Wash.

833,204. Dental bite-taker. Lyter H. Crawford, New York, N. Y.

833,375. Dental instrument for slitting and removing cap-crowns. Leo Dollar, Philadelphia, Pa.

833,254. Dental crown construction. Carl A. Skalstad, Chicago, Ill.

Copies of above patents may be obtained for ten cents each, by addressing John A. Saul, solicitor of patents, Fendall building, Washington, D. C.

ANNOUNCEMENT.

The members and friends of the G. V. Black Dental Club of St. Paul (Inc.) will hold their annual midwinter clinic in February, 1907.

Last year we held the largest, best and most enthusiastic meeting ever held in the Northwest, between 400 and 500 practitioners being in attendance. This year we wish to have an attendance of 1,000.

The program is now being arranged by the clinic committee. The operative clinic will be on its usual high order. There will be a number of progressive clinics on both days of the meeting. Several of the best known men in the dental profession will read essays.

The table clinics will be the most interesting and instructive which we are able to obtain. The program and dates on which the meeting will be held will shortly be published.

As this is the only midwinter clinic held in this section of the country, I take greatest pleasure in extending a most cordial invitation to the members of the dental profession in the United States and Canada to attend our clinic.

Special rates on all railroads.

For any further information apply to R. B. Wilson, *Secretary,*
107 East Sixth Street, St. Paul, Minn.

BANQUET TO DR. G. V. BLACK.

The Fraternal Dental Society and the St. Louis Society of Dental Science will unite in giving a banquet in honor of Dr. G. V. Black at the Jefferson Hotel, St. Louis, the evening of January 15, 1907. The afternoon of the same day Dr. Black will deliver an illustrated lecture on some phases of Operative Dentistry.

The long and untiring efforts and valuable scientific contributions of Dr.

Black easily make him the foremost dental scientist the world has ever produced. No dentist, living or dead, so much deserves the thanks and praise of his professional associates. A most cordial invitation is extended to the members of the profession to be present at both lecture and banquet and assist in honoring Dr. Black. Those desiring covers reserved for banquet will remit $5.00, price per plate, to Dr. Richard Summa, secretary, Orial building, before January 13.

GEO. A. BOWMAN, *Chairman,*
A. H. FULLER,
EDWARD H. ANGLE,
D. O. H. LECRON,
ADAM FLICKINGER,
WM. CONRAD,
BURTON LEE THORPE.
Committee.

A PUBLIC DENTAL LIBRARY IN THE CITY OF COLUMBUS, OHIO.

The trustees of the new Columbus Carnegie Library building, a handsome structure, costing $250,000, have set apart a room 40x60 feet, for the exclusive use of a dental and medical library.

Columbus being centrally located and of easy access to the majority of the dentists in the State, should be the home of what the dental profession has hitherto been without—a library complete in all the literature of the profession, making it invaluable for research and reference.

The local dentists have organized a Dental Library Association for the express purpose of bringing this matter to a successful issue, and the work thus far accomplished far exceeds our expectations. The Columbus dentists alone have donated $500 in cash and a number of books and magazines.

To make this library complete in embracing all known works pertaining to our specialty and complete files of all the journals published, we desire the co-operation of every dentist in the State. Any old and rare works, copies of old journals, etc., will be gratefully received, inscribed with the name of the donor, and recorded to his credit in the library catalogue. Please communicate with us concerning any literature you may have that you can donate to this cause, giving titles and authors of books; names and dates of journals, etc. In case of duplication they will be valuable for exchange with other libraries.

DR. EDWARD C. MILLS, *Secretary,*
10 Y. M. C. A. Building.

DR. W. H. TODD, *President,*
190 South High Street.

THE PENDING ARMY AND NAVAL DENTAL BILLS.

To the Editor—The parliamentary status of the Army and Navy Dental Bills continues unchanged from the past to the next session of the fifty-ninth Congress and, therefore, either bill may be called from the house calendar and passed as a separate measure or added as an amendment to any subject of legislation to which it may be germane.

The Navy Bill, H. R. 13851, provides for thirty individual dental surgeons with "the rank and compensation of acting assistant surgeon," but falls short of what was sought by the N. D. A. Com. in that it fails to provide corps organization, regular rank with right to promotion and retired pay, and dental examiners to examine in dental subjects. However, this bill has had the approval of the N. D. A. Com. since January, 1905, as the best obtainable and because of an understanding that the enactment of the Army Bill would establish a precedent for a substantially identical measure for the navy. It was also understood that the parliamentary status attained by a favorable report on H. R. 13851, with its provision for limited rank, would be advantageous in promoting Senate 3150 with its provision for regular rank.

The law under which thirty army dental surgeons are now employed was framed and promoted to its passage by the N. D. A. Com. under instructions recommended by Drs. McManus, Hinman and Noel, to-wit: "In reference to the report of Drs. Donnally and Finley, we do not entirely agree with them 'that we should work for status only,' but recommend that this Association work for the admission of dentists into the army and navy and then for their status." Accordingly the passage of the contract bill, February 2, 1901, was followed at the next session of Congress by army and navy dental bills identical in their provisions for corps organization, grades of rank, and eligibility requirements, the army bill differing in that it made contract dental surgeons eligible to rank regardless of age and without tests of physical or professional fitness. The army bill was then favored by Surgeon Sternberg, but vigorously and successfully opposed by Secretary Root, the chief of staff, and Secretary Taft, an array of opposing military authority against which the resources of the N. D. A. Com. made slow though equal progress in Congress with the medical bill which is advocated by all these authorities, by President Roosevelt and by the united medical profession speaking through its national body, thirty-eight states and 2,300 county societies and many of its colleges and individual members.

The first tangible step in the legislative progress of the pending army dental bill was when the surgeon general, yielding in a measure to the N. D. A. Com., agreed to favor a bill to be drawn in accord with the views he expressed officially under date of April 15, 1904. His views, briefly stated, were: That the number of dental surgeons should not exceed thirty. That all should start with the rank of lieutenant. That all alike should be required to meet prescribed age, physical and professional standards. That, on examination, five should be promoted to captain after five years and three to major after fifteen years' service; and that the dental examining board should be composed of one dental surgeon selected by the secretary of war from the contract dental surgeons and two dental surgeons nominated to the secretary of war by the president of the American Dental Association.

No bill to exactly accord with these views was framed, but, taking these views as an only basis for a compromise, the provisions of Senate 2355 were favored and presented to Congress January 26, 1905, with the all-important approval of the surgeon general and the all but fatal renewed disapproval of the general staff and chief of staff.

The more important concessions contained in this bill which were not included in the official views of April 15, 1904, are:

(a) An increase of about 100 per cent in the number of dental surgeons.

(b) An unprecedented exemption of all contract dental surgeons from an age standard universally required of commissioned officers.

(c) An unparalleled liberality in accepting, at the option of the surgeon general, the entrance contract physical and professional examinations instead of a re-examination on the higher standard required for commissioned rank—a concession not granted or proposed to be granted the contract surgeons.

(d) Granting mounted rank and reckoning time served in contract positions in computing longevity pay, thus at once increasing this pay from $260 to $400 per annum.

(e) Creating three captaincies instead of them being earned by five years' service and making them eligible to majorities after ten years instead of after fifteen years' service, and increasing the whole number of captains threefold and the majors twofold.

(f) Changing the surgeon general's recommendation that two examiners be "nominated to the secretary of war by the president of the American

Dental Association" to certification of their qualification by the executive council of the N. D. A., thus changing the "nomination" by one man to "certification of qualification" by seven men and changing the appointing power from a political to a medical officer.

With these liberal provisions, which were not all desired though more than could reasonably be expected to escape congressmen who were prompted to give them special scrutiny, the bills passed the Senate April 23d, but with an ill-advised amendment by which it was intended to displace the board provision by one which would place an army surgeon at the head of a board to examine in practical dentistry and the subjects of a dental college course.

If this amendment should prevail against the recommendation of the surgeon general, the N. D. A. Com. and the Senate and House Military Committees, and the view expressed by the N. D. A. in 1900 on the recommendation of Drs. C. N. Johnson, James McManus and T. T. Moore, to-wit: "We respectfully ask the association to carefully consider the question of the surgeon general's intimation that this association suggest candidates for appointment as examining dental surgeons under the proposed law, and the committee feels that the power to recommend resides with the executive council," it is believed by the best informed that it will create friction between medical and dental officers, give undue weight to the surgeon's estimate of the value of the dental educational course, deprive the N. D. A. of the intended recognition of its philanthropic motives in successfully promoting an army bill of humane and economic value, and, in seeking further legislation, this surgeon's views, rather than the dental surgeon's would likely prevail with the war department authorities. It would also deprive the surgeon general of the right to retain in the service, as a civilian examiner, any professionally qualified contract dental surgeon who might, through the amendments or by reason of age or physical condition, fail to secure regular rank.

On April the 28th, the House Military Committee reported favorably this bill and recommended the adoption of amendments restoring the original board provision, limiting the number of dental surgeons to forty-five, requiring one year's probation under contract as a test of fitness for rank, and requiring that all contract dental surgeons in order to be eligible for rank, must have been within the standard age (thirty years) at the time they entered the contract service.

These proposed amendments should not have been made the occasion for ill-considered comment, or for the use of means to restore the original provisions of the bill, that would reflect on the good faith and just intent of the military committee or other committee or person. More objectionable provisions had been proposed and, through the quiet and orderly effort of the N. D. A. Committees withdrawn. It is true that under one of the proposed amendments, *if adopted without modification* seven contract dental surgeons would lose their positions, but, through the immediate co-operation of members of the military committee, the surgeon general and the N. D. A. Committee, the modification of the effect of this amendment was assured within a few days after it was proposed.

In order to make sure of the retention in the service of *all* the seven over-aged without loss of pay, tenure or prospect of more favorable legislation later, it is necessary that they and their friends should feel and show an equal interest in each of the seven (that is, for the seven as a class) and not seek a personal advantage for one over another. Under such a condition the plans of the surgeon general and the N. D. A. Com. may be safely trusted to carry, without loss to any one, while all that has been gained through strenuous effort for the profession and for the army and navy corps may be retained and enlarged with enduring honor and increasing benefit to the profession. Yours faithfully, WMS. DONNALLY.

COLUMBIA UNIVERSITY LIBRARIES

This book is due on the date indicated below, or at the expiration of a definite period after the date of borrowing, as provided by the rules of the Library or by special arrangement with the Librarian in charge.

DATE BORROWED	DATE DUE	DATE BORROWED	DATE DUE
	JUN 10 1941		
	DEC 1 1942		
	MAR 16 1948		
	MAY 5 1971		
C28(1140)M100			